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FACULTY OF PHARMACY

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THE EDINBURGH NEW DISPENSATORY:

CONTAINING,

I. THE ELEMENTS OF PHARMACY.

II. THE MATERIA MEDICA;

OR THE NATURAL, CHEMICAL AND MEDICAL HISTORY, OF THE SUBSTANCES EMPLOYED IN MEDICINE.

III. THE PHARMACEUTICAL PREPARATIONS AND COMPOSITIONS;

INCLUDING
TRANSLATIONS OF THE DUBLIN PHARMACOPŒIA OF 1826,
LONDON PHARMACOPŒIA OF 1825, AND OF THE
EDINBURGH PHARMACOPŒIA OF 1817.

WITH ILLUSTRATIVE COMMENTARIES, AND TABLES.

TWELFTH EDITION,
MUCH ENLARGED AND IMPROVED.

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ROYAL SOCIETY OF EDINBURGH.

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PREFACE

TO THE TWELFTH EDITION.

SINCE the commencement of the present century, this work has been the constant object of my study; and when I review the great progress which pharmacological knowledge has made in this country during that period, I feel gratified in thinking, that it has been, in some degree, owing to the information which the Edinburgh New Dispensatory has been the means of disseminating through all classes of the profession.

Dr LEWIS published the first edition of his *New Dispensatory* in 1754. It consisted principally of a commentary upon the London and Edinburgh Pharmacopœias, of both of which it contained a complete translation. A concise system of the Theory and Practice of Pharmacy was prefixed as an introduction; and directions for extemporaneous prescription, with many elegant examples, and a collection of efficacious, but cheap remedies, for the use of the poor, were added as an appendix.

The manner in which the whole was executed, placed Dr LEWIS at the head of the reformers of Chemical Pharmacy; for he contributed more than any of his predecessors to improve that science, both by the judicious criticism with which he combated the erroneous opinions then prevalent, and by the actual and important additions he made to that branch of our knowledge. He merited and received the decided approbation of the public. During his lifetime many editions were published, with such improvements as the advancement of the sciences connected with Pharmacy suggested.

After the death of Dr Lewis, an Edinburgh New Dispensatory was published with great improvements, rendered necessary by new editions of the Pharmacopœias, and increased knowledge of the natural history and chemistry of drugs. It was edited first by Dr Webster, and afterwards by my Father, and Dr Rotheram, in succession.

When the Edinburgh College were preparing a new edition of their Pharmacopœia in 1800, I undertook, at the request of the publishers, that it should be followed by a corresponding Dispensatory. This seemed to me absolutely necessary, not only on account of the progress of the sciences connected with medicine, but likewise to revive the study of the chemistry of drugs, which, during the latter period of the preceding century, had been very much neglected in this country, in consequence of the attention of chemists being directed almost exclusively to the discoveries of Black, Priestley, and Cavendish, and to the controversy between the adherents of the theory of Phlogiston, and those who espoused the opinions of Lavoisier.

Among physicians, Vegetable Chemistry was also neglected, partly from the imperfect state of the analysis of organic bodies, but still more in consequence of the dogmatism of the Brunonian School, and the professional scepticism of Cullen, who represented the chemical analysis of drugs as of no use in explaining or ascertaining the virtues of medicines, and as unworthy of being studied by rational practitioners. It appeared to me that a very different view of the subject was more correct. Although the reaction excited by medicines in organs endowed with life is purely vital, and not to be explained by physical or chemical laws, yet medicines themselves are dead substances, and can only act in consequence of their physical or chemical properties. I therefore conceived, that the peculiar virtues of medicines must depend upon their chemical constitution, and that it was only by investigating the nature of the proximate principles of which they consist, and acquiring a knowledge of their properties, that we could rationally expect to make progress in Pharmacology.

Before becoming an author on these subjects, I considered it to be my duty to select, from the older writers, whatever appeared still to possess value, and to ascertain, by actual experiments, many points, in regard to which, I was either unable to find satisfactory information, or met with contradictory statements. Although these experiments would now be considered rude, I have reason to believe, that they not only added to our information on the subject, but that from them, taken in conjunction with the facts collected from others, the early editions of the Edinburgh Dispensatory had some share in directing the attention of chemists to a field which had long lain fallow, and which has since fully repaid the labour of cultivation.

The continued success of the Dispensatory, notwithstanding the publication of many able works of a similar nature, has been, in a great measure, owing to the numerous alterations and improvements made in each succeeding edition, so that it has never been allowed to fall behind the state of the science. I have not, indeed, taken advantage of the productions of my competitors so often as perhaps I should have done; not from underrating their works, but because I have always thought it more advantageous to make generally known in this country the information on the subjects of Pharmacology and Pharmacy, contained in the works of the best foreign writers.

It now remains for me to mention the alterations that have been made in the present edition. The increase of the size of the volume, by nearly one-fifth, is an evident proof of their extent; and I hope their value is not less. Two circumstances rendered a complete revision necessary; the publication of a new edition of the Dublin Pharmacopœia, and the addition of a series of valuable notes by MM. ROBIQUET and CHEREAU to a translation into French of the tenth edition.

The intrinsic value of the recent Dublin Pharmacopœia is greatly enhanced by the publication of the first part of "Observations, Chemical and Practical, on the Dublin Pharmacopœia of 1826, with a translation annexed by Dr BARKER, Professor of Chemistry in Trinity College." This work, distinguished alike for its perspicuity and conciseness, is chiefly valuable to students of pharmacy, as containing the experimental facts on which the processes and proportions of the officinal preparations were determined. In the use I have made of this volume, I trust that I have not gone too far; and I regret that I have not had an opportunity of benefiting equally by the second part, which has not yet been published.

The circumstance of notes being added to M. PELOUZE's well-performed translation of the tenth edition by MM. ROBIQUET and CHEREAU, was to myself the most encouraging compliment, which my efforts to promote the knowledge of my profession ever received; but to my readers the value of these notes, avowedly intended to raise the work to the actual level of the science, is of infinitely greater importance, as they have enabled me to correct and supply all that seemed erroneous and defective to judges of the highest reputation, in a country where pharmacy is estimated by a very different standard from what it is in this empire. Indeed, these notes appeared to me so valuable, that I lost no time in publishing a translation of them, with subjoined commentaries, as a supplement to the preceding editions of the Dispensatory. In these I sometimes indulged myself by going into greater detail than is suitable for the condensed form of an elementary work; but the incorporation of the material facts and explanations communicated by MM. ROBIQUET and CHEREAU has rendered this edition of the Dispensatory more valuable than any of the former.

In the Appendix to the Elements of Pharmacy, I have introduced new tables and lists. I shall advert to only two of these. I have added a list of the plants, now officinal in the British Pharmacopœias, arranged according to the system of natural orders in DE CANDOLLE'S Essay on the Medical Properties of Plants, because it is the order followed in that part of my Lectures which corresponds to what is often called Medical Botany, and to which it serves as a text-book. I have also added a physiological classification of the Materia Medica, which, if I am entitled to judge, has some of the merit usually conceded to attempts to improve the general principles of any science. This classification also serves as outlines of that part of my course which treats of General Dietetics and Pharmacology.

In revising the body of the work, I have spared no pains in elucidating doubtful points by personal observation and experiments, and I have consulted the best authors so far as my time permitted; for works on Pharmacology and Pharmacy are now so multiplied, that it is impossible for any person to peruse them all. I feel, however, pleasure in acknowledging my obligations, in preparing the present edition for the press, to the Elementary Treatises on Pharmacy by Buchner, Carbonell, Caventou, Chevallier and Idt, and to the excellent volume on Chemical Manipulation by M. Faraday, as well as Gray's Operative Chemist, and Dr Reid's Elements of Practical Chemistry, so far as they are applicable to Pharmacy. On the subject of Pharmacology, I have derived much valuable information from the publications of Hayne, Roques, Guibourt, and Dr Bigelow, from the commentaries upon the translation of the Parisian Codex by M. Ratier, and upon that of the late Berlin Pharmacopœia by Dr Dulk, and more particularly from the *Pharmacopée Raisonnée* of MM. Henry and Guibourt. I have also consulted the *Dictionnaire des Drogues* of MM. Chevallier, Richard and Guillemin, and the *Dictionnaire de Matière Médicale* of MM. Mérat and De Lens, and, as often as it appeared necessary, I have referred to the valuable original articles in the Repertorium fur die Pharmacie of Buchner, in the *Journal de Chimie Médicale*, and in the *Journal de Pharmacie*, with the editors of the last of which, however unworthily, I have the honour to be associated.

Edinburgh, 1st September 1830.

CONTENTS.

PART I.

ELEMENTS OF PHARMACY.

Page
Object and division of pharmacy, ... 17
Collection and preservation of simples, ... 19
Mechanical operations of pharmacy, ... 24
Weights and measures, ... ib.
Specific gravity, ... 26
Mechanical division, by pulverization and granulation, . . . 28
Mechanical mixture, ... 33
Mechanical combination, ... 34
Mechanical separation, by sifting, elutriation, deposition, decantation, filtration, expression, and clarification, ... ib.
Apparatus, ... 40
Vessels, ... ib.
Lutes, ... 43
Heat and fuel, ... 46
Furnaces, ... 49
Chemical operations, ... 51
    Change in the form of aggregation, ... ib.
    Liquefaction, ... 52
    Fusion, ... ib.
    Crucibles, ... 54
    Vaporization, ... 55
    Evaporation, ... 56
    Spontaneous evaporation, ... ib.
    Ebullition, ... ib.
    Concentration, ... 57
    Inspissation, ... ib.
    Exsiccation, ... ib.
    Ustulation, ... 58

Page
Chemical operations,
Charring, . . . 58
Condensation, . . . 59
Distillation, . . . 60
Circulation, . . . 62
Abstraction, . . . 65
Cohobation, . . . 67
Dephlegmation, . . . ib.
Rectification, . . . ib.
Sublimation, . . . ib.
Congelation, . . . 70
Coagulation, . . . ib.
Gelatinization, . . . ib.
Combination, . . . 71
Solution, . . . 76
Extraction, . . . 79
Infusion, . . . 80
Maceration, . . . 81
Digestion, . . . ib.
Decoction, . . . ib.
Decomposition, . . . 83
Dissolution, . . . ib.
Precipitation, . . . 84
Crystallization, . . . 85
Oxygenizement, . . . 96
Deflagration, . . . 98
Disoxygenizement, . . . 101
Fermentation, . . . 104

APPENDIX.

Weights and measures, . . . 106
Tables of specific gravity, . . . 134
Comparison of the degrees of Baumé's and Beck's hydrometer, with the specific gravity, . . . 145
Correspondence between different thermometers, . . . 149

Page
Table of the effects of heat, ... 150
Temperatures at which various pharmaceutical phenomena take place, ... 154
Frigorific mixtures, ... 155
Tables of simple affinity, ... 158
Relative attractions, ... 161
Cases of mutual decomposition, ... ib.
Table of incompatible salts, ... 162
Table of atomic weights of bodies, ... 163
Table of the solubility of salts in water, ... 169
Table of substances soluble in alcohol, ... 173
Table of the proportion of oil and suet in various fats, . . . 174
Table of efflorescent and deliquescent salts, ... 175
Table shewing the proportion of water of crystallization in salts, ib.
Colour of precipitates, ... 177
Classification of vegetable principles, ... 178
Classification of vegetable materia medica, ... 180
Classification of pharmaceutical processes and form of medicines, 184
List of simples to be collected, and operations to be performed, in each month of the year, by the pharmaceutists in Paris, 187
Pharmaceutical calendar, ... 191
List of officinal plants in the British Pharmacopœias, . . . 192
Classification of the materia medica as objects of natural history, 200
List of pharmacopœias in the states of Europe and America, . 222

PART II.

MATERIA MEDICA.

General observations, ... 225
Natural, medical and pharmaceutical history of the different articles contained in the Pharmacopœias of London, Dublin, and Edinburgh, arranged chiefly according to the nomenclature of the Edinburgh College, ... 226

PART III.

PREPARATIONS AND COMPOSITIONS.

		Page
CHAP. I.	Sulphur,	649
II.	Acids,	656
III.	Alkalies and alkaline salts,	688
IV.	Earths and earthy salts,	733
V.	Metalline preparations,—Antimony,	751
VI.	Silver,	765
VII.	Arsenic,	769
VIII.	Bismuth,	771
IX.	Copper,	773
X.	Iron,	776
XI.	Mercury,	790
XII.	Lead,	818
XIII.	Tin,	822
XIV.	Zinc,	ib.
XV.	Alcohol, ether, and ethereal spirits,	829
XVI.	Vegetabilia,—Vegetables,	844
XVII.	Expressed and inspissated juices,	850
XVIII.	Fixed oils,	861
XIX.	Oily preparations,	864
XX.	Volatile oils,	867
XXI.	Empyreumatic volatile oils,	876
XXII.	Distilled waters,	878
XXIII.	Distilled spirits,	883
XXIV.	Infusions,	889
XXV.	Decoctions,	899
XXVI.	Mucilages,	907
XXVII.	Syrups,	911
XXVIII.	Medicated honeys,	925
XXIX.	Emulsions and mixtures,	930

Page

CHAP. XXX. Acetica.—Medicated vinegars, ... 937

XXXI. Tinctures, ... 941

XXXII. Tinctures made with ethereal spirits, . . . 968

XXXIII. Ammoniated or volatile tinctures, ... 969

XXXIV. Medicated wines, ... 973

XXXV. Extracts and resins, ... 978

XXXVI. Powders, ... 1000

XXXVII. Conserves, electuaries and confections, . . . 1008

XXXVIII. Troches, ... 1017

XXXIX. Pills, ... 1019

XL. Cataplasms, ... 1028

XLI. Liniments, ointments, cerates and plasters, . . 1031

TABLES, shewing the proportion of antimony, opium and mercury, contained in different compositions, ... 1067

Table of synonimes, ... 1070

English index, ... 1099

Latin index, ... 1113

THE

EDINBURGH

NEW DISPENSATORY.

PART I.

ELEMENTS OF PHARMACY.

1. THE principal object of Pharmacy [*] is to provide [†] and dispense those substances which may be employed for the prevention or cure of disease.

2. To obtain this object completely, an acquaintance with the physical and chemical properties of these substances is necessary. This may be termed the *Science of Pharmacy.*

3. Few substances are found in nature in a state fit for their exhibition in medicine. The various preparations which they must undergo to fit them for this purpose, constitute the *Art of Pharmacy.*

4. As a *Science*, Pharmacy is identical with Chemistry; but as an *Art*, it has a limited object; and for its successful practice, an intimate acquaintance with the peculiar application of its principles is necessary.

5. The practice of pharmacy consists in,

a. The collection and preservation of simples.

b. The performance of the processes to which they are subjected.

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[*] Pharmacy is from φαρμακον, a drug, poison, or pigment. Pharmacopolist is from φαρμακοπωλης, a seller of drugs. Αποθηκη, from which apothecary is derived, literally means a storehouse, in which substances are collected and preserved for use. Herbalist, druggist, distiller, chemist, and manufacturing chemist, are denominations given to those who practise particular branches of the art.

[†] M. Pelouze, whose translation of this Dispensatory is in general remarkably accurate, has rendered this word by *préparer*. This is not sufficiently comprehensive. I meant to include, in one term, the collection, purchase and preparation of medicinal substances.

6. A complete pharmaceutical establishment includes various departments, for carrying on which a suite of apartments is necessary.

- *a.* The shop.
- *b.* The store.
- *c.* The laboratory.

7. The *shop* is where the medicines are dispensed and sold, prescriptions are compounded, and a sufficient quantity of each of the officinal simples and preparations is kept in readiness for immediate use.

8. An apothecary's shop should be roomy, well lighted, remarkably clean, even elegant, and well arranged.

9. In the arrangement, the chief objects are to diminish labour, to prevent mistakes and accidents, and to be easily understood by new assistants.

10. The *store* must consist of different apartments, of two kinds.

- *a.* One adapted for substances which sustain the ordinary changes of the temperature of the atmosphere without suffering any material change, but which are soon spoiled by damp,—the *herbarium,* herb-loft, drug warerooms.
- *b.* Another for substances which are injured by great heat or cold, and for which a moderate or cool, but uniform temperature, between 32° and 55°, is suited,—the cellar, or *aquarium.*

11. The *laboratory* also requires several apartments.

- *a.* The proper chemical laboratory.
- *b.* The powdering room.
- *c.* The drying room.

12. The laboratory should be lofty, spacious, well lighted, with good flues and open chimneys, and an arched fireproof roof, well supplied with water, and have a good sink and drain. It should have all the fixed chemical apparatus properly disposed, as furnaces, sand-bath, steam apparatus, &c. There should be proper and well-secured shelves and racks for the moveable apparatus, as all kinds of glass vessels, crucibles, kettles, pans, ladles, mortars, &c.

13. The process of powdering, when on a considerable scale, must be carried on in a separate apartment, on account of the dust and noise, and the space required for the machinery.

14. A drying room, in which a constant temperature of from 100° to 120° is kept up by heated air or a sand bath, is a great advantage, for the drying quickly of vegetable and other simples, the digestion of tinctures, and slow evaporation.

15. The articles to be provided by the apothecary have been divided by the editors of pharmacopœias, but not very correctly, into,

a. Materia Medica, or Simples.

b. Composita and *Præparata*, or Preparations.

16. Many substances commonly enumerated among the *Materia Medica* are in reality prepared, but are understood to be purchased by the apothecary in their prepared state, while others in the list of simples actually require and receive from him the most careful preparation.

17. On the other hand, many articles, for the preparation of which *formulæ* are given in the pharmacopœias, are never prepared by the apothecary himself, but are purchased from manufacturing chemists.

18. The articles used in medicine are, either,

a. Foreign, or

b. Indigenous.

19. The foreign articles are purchased from wholesale druggists, or merchants who import them. On the part of the apothecary, much knowledge is requisite to judge of their genuineness and quality. Waarenkunde of the Germans.

20. Indigenous articles are either collected by the apothecary himself, or purchased from persons who make a trade of collecting them.

COLLECTION AND PRESERVATION OF SIMPLES.

21. Each of the kingdoms of nature furnishes substances which are employed in medicine, either in their natural state, or after they have been prepared by the art of pharmacy.

22. In collecting the articles of the Materia Medica, attention must be paid to get such as are genuine, to select such as are most sound and perfect, to separate from them whatever is injured or decayed, and to free them from all foreign matters.

23. Those precautions must be taken which are best fitted for preserving them. They must, in general, be defended from the effects of moisture, too great heat or cold, and confined air.

24. When their activity depends on volatile principles, they must be preserved from the contact of the air as much as possible.

25. Those which are acted upon by light, so as to have their sensible qualities altered, and their virtues impaired, must be carefully protected against its influence.

26. Medicinal substances differ so much in their nature, that special directions are required for each kind.

27. *Vegetable simples.*—As the vegetable kingdom presents us with the greatest number of simples, and the substances belonging to it are the least constant in their properties, and most subject to decay, it becomes necessary to give some general rules for their collection and preservation.

28. Vegetable matters should be collected in the countries where they are indigenous *; and those which grow wild, in dry soils and high situations, fully exposed to the air and sun, are in general to be preferred to those which are cultivated, or which grow in moist, low, shady, or confined places †.

29. *Roots.*—Annual and biennial roots are either fibrous, merely to nourish the plant, or fleshy, constituting a useful product of vegetation. Annual or biennial fibrous roots are rarely used; but the fleshy roots are sometimes employed in medicine, and often as food, as the carrot and turnip. These roots are perfect before they shoot up the flower stem, after which they become stringy and sapless. The annual tubers of the potatoe are now an indispensable article of food.

30. Perennial roots should also be collected during winter; because they then abound with the proper juices elaborated by the leaves of the preceding season, laid up in the roots to feed the shoots of next spring; and because roots are apt to bleed when wounded after the vegetation has commenced.

31. Bulbous roots should be collected after the new bulb is perfected, and before it has begun to vegetate, or after the leaves of the season have decayed, in consequence of having performed their functions.

32. Roots of herbaceous perennial plants should be collected in autumn after the stem drops, and while it is still attached; or the places where they grow, and even fine plants, should be marked during the preceding summer, that they may be dug up in autumn or spring. At any rate, great knowledge of their *habitats* is necessary to prevent mistakes.

33. Ligneous roots of shrubs and trees, as mezereon, are to be gathered during winter, when vegetation is dormant.

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* Some vegetable drugs are greatly improved by cultivation, as all the fruits; and others are not to be otherwise procured, as the *cerealia,* or not in sufficient quantity, as many aromatics, flowers and plants.

† Some plants grow only in the shade; and succulent plants, which grow in exposed situations, furnish little juice. But no plant for medical use should be at all etiolated.

34. All decayed or worm-eaten roots are to be rejected. The others are to be cleaned with a brush and cold water, letting them lie in it as short a time as possible; and the fibres and little roots, when not essential, are to be cut away.

35. Some roots, whose active principle is very soluble in water, are to be dried without wounding or washing them, and the earth afterwards removed.

36. *Leaves.*—The proper period for gathering leaves depends upon their nature. All leaves are unfolded, reach their full size, and decay within a certain space of time. Young leaves are tender and succulent, and contain much water and common sap. In full-grown leaves the proper juices are most perfect. Some leaves, especially articles of aliment, are preferred when young and delicate, as sorrel, spinach; others of a middle growth, as tea, because the flavour is evolved, but still delicate; and others, especially medicinal leaves, when full grown, as being then most powerful.

37. *Herbs* whose stem is annual are gathered in the same manner as leaves. Aromatic herbs after the flower-buds are formed, or when in flower, for till then they do not acquire their full flavour.

38. Leaves and herbs are to be gathered in dry weather, after the dew is off them, or in the evening before it falls, and are to be freed from decayed or foreign leaves.

39. *Sprouts* and *buds* are collected in spring before the leaves expand.

40. *Stalks* and *twigs* are gathered in autumn.

41. *Barks* are collected in spring or in autumn, when the most active parts of the vegetables are concentrated in them. Spring is preferred for resinous barks, and autumn for the others which are not resinous, but rather gummy. Barks should be taken from trees of moderate age, and freed from decayed parts, and all impurities.

42. The same rules are to be followed in collecting *woods*. Among the resinous woods, the heaviest, which sink in water, are selected. The *alburnum* sap-wood or splint is directed to be rejected.

43. *Flowers* and *flower buds* are to be collected in clear dry weather, before noon, but after the dew is off, either when they are just about to open, or immediately after they have opened. Of some, the petals only are preserved, and the colourless claws are even cut away; of others, whose calyx is odorous, the whole flower is kept. Flowers which are too small to be pulled singly, are dried with part of the stalk; these are called *heads* or *tops*.

44. *Fruits,* unless when otherwise desired, are to be gathered when fully ripe, but before they fall spontaneously.

45. *Seeds* are gathered fully ripe. Many fruits and seeds are apt to spoil, or become rancid; and as they are then no longer fit for medical use, no very large quantity of them should be collected at a time.

46. *Mosses, lichens* and *fungi* are gathered after their full development, and require particular care in cleaning them from foreign and other matters; and some of the *fungi* must be dried very rapidly.

47. *Resins,* gum-resins, balsams, turpentines and gums, are all foreign productions, and their preservation requires little attention.

48. Vegetable substances are used,

a. Either as soon as they are collected,
b. Or after they have been kept some time.

49. The juices of succulent fruits, herbs and roots are expressed immediately after their collection.

50. For preservation in vinegar, syrup, spirit, or a solution of salt, vegetables are also used in their recent state.

51. Some delicate vegetables may be preserved for a long time in a fresh state, by confining them in vessels from which the air is carefully excluded. This process, although very ancient, has been improved and extended by *M. Appert.*

52. Vegetable substances are most commonly preserved by drying them thoroughly, by which means their decay is greatly retarded.

53. The proper drying of vegetable substances is of the greatest importance to their preservation. It is often directed to be done in the shade, and slowly, with the intention, that the volatile and active particles may not be dissipated by too great heat: but this is an error; for they always lose more by slow than by quick drying. When, on account of the colour, they cannot be exposed to the sun, and when the warmth of the atmosphere is insufficient, they should be dried by an artificial warmth, less than 100° Fahrenheit, and exposed to a free current of air.

54. Leaves and herbs are usually tied in bundles, and hung up in a shady, warm, and airy place, or spread upon the floor, and frequently turned. If very juicy, they are laid upon a sieve, and dried by a gentle degree of artificial warmth.

55. Flowers are to be dried nearly in the same manner as leaves, but more quickly, and with more attention. As they must not be exposed to the sun, it is best done by a slight degree of artificial warmth; and in some cases they should

be put up in paper bags. When they lose their colour and smell, they are unfit for use.

56. Roots which consist principally of fibres, and have but a small tap, may be immediately dried. If they be juicy, and not aromatic, this may be done by heat, not exceeding 100° of Fahrenheit; but if aromatic, it is to be done by simply exposing them, and frequently turning them in a current of dry air; if very thick and strong, they are to be split or cut into slices, and strung upon threads; if covered with a tough bark, they may be peeled fresh, and then dried. Farinaceous roots are to be dipt in boiling water before they are dried.

57. Some pulpy fruits are freed from their core and seeds, strung upon thread, and dried artificially, by exposing them repeatedly to the heat of a stove. They are in general best preserved in their natural coverings, although some, as the colocynth, are peeled, and others, as the tamarind, immersed in syrup.

58. The mucilaginous and farinaceous seeds are to be dried by artificial heat, but the oily and emulsive have their disposition to rancidity increased by a very slight elevation of temperature, and must therefore be dried in a very airy cool place.

59. When vegetable substances are rendered perfectly dry and friable, they have little smell; but after being kept some time, they attract moisture from the air, and regain their proper odour.

60. The boxes and drawers in which vegetable substances are kept, should not impart to them any smell or taste; and more certainly to avoid this, they should be lined with white paper. Such as are volatile, of a delicate texture, or subject to suffer from insects, must be kept in well-covered glass bottles.

61. Many vegetable powders must be kept in opaque bottles, or in bottles covered with dark paper, to preserve them from the action of light.

62. Fruits, oily seeds, odorous plants, and those containing volatile principles, should be collected fresh every year; others, whose properties are more permanent, and not subject to decay, will keep for several years.

63. Vegetables collected in a moist and rainy season are in general watery, and apt to spoil. In a dry season, on the contrary, they contain more oily and resinous particles, are more active, and keep much better.

64. Notwithstanding the most careful preparation and preservation, vegetable substances undergo a gradual de-

composition, indicated by change of colour, loss of smell and virtue, or becoming musty or rancid, and therefore they should be frequently examined and rejected when these changes appear.

65. Few *animal substances* are used in medicine; none are collected by the apothecary in this country.

66. *Fats* become rancid by keeping; and *insects* are destroyed by insects.

67. *Castor*, musk, isinglass, crabs' eyes, oyster shells and hartshorn, keep any length of time.

68. *Mineral substances* require only to be preserved from dust and foreign matters.

MECHANICAL OPERATIONS OF PHARMACY.

a. The determination of the weight and bulk of bodies.
b. The division of bodies into more minute particles.
c. The separation of their integrant parts by mechanical means.
d. Their mixture when not attended by any chemical action.

WEIGHTS AND MEASURES.

69. The quantities of substances employed in pharmaceutical operations are most accurately determined by the process called weighing.

70. The instruments for determining weights are,
a. Balances.
b. Steelyards, on the principle of the lever.
c. Steelyards with a compressible spring.

71. The last is convenient from the facility with which it is used. The second is used chiefly for great weights. But the first is the only instrument fit for pharmaceutical purposes, as it is the most accurate, and may be made to check itself, by reversing the position of the weight and of the substance weighed.

72. There should be sets of beams and scales of different sizes; and it would be advisable to have a double set, one for ordinary use, and another for occasions when greater accuracy is necessary.

73. A good beam, whether lightly or fully loaded, should vibrate freely, remain in equilibrium both by itself and when the scales are suspended, one to either end indifferently; and it should turn sensibly with a very small proportion of the weight with which it is loaded. Balances should be defend-

ed as much as possible from acid and other corrosive vapours, and should not be overloaded, or left suspended longer than is necessary, as their delicacy is thereby very much impaired. It is not unnecessary to mention, that the scales and weights, as well as measures, funnels, mortars, &c. should be kept extremely clean. Some nice apothecaries have their scales made of silver, glass, ivory, or tortoise shell; and it is now very rare to find the common brass scales ill kept or spotted with verdegris.

74. The weights themselves are pieces of metal previously adjusted by a public officer. Those for grains, scruples, drachms and ounces, and as far as the pound, are made of brass; those for fractions of grains, and for chemical purposes, of silver wire; and those for pounds and larger weights of cast-iron or lead. They are made of various forms. The grains are generally flat, to give them sufficient extension, with an edge turned up, and they are marked with the number of grains they weigh. The scruples, drachms and ounces are of various forms, square, discoid, or cup-shaped, constituting piles or sets.

75. The want of uniformity of weights is attended with many inconveniences. In this country, druggists and grocers have been accustomed to buy and sell by avoirdupois weight; and the apothecaries also buy by avoirdupois weight, but are enjoined to sell by troy weight. In fact, however, they seldom use the troy weight for more than two drachms. But as the troy pound is less than the avoirdupois, and the ounce and the drachm greater, numerous and culpable errors arise from this practice. Comparative tables of the value of weights of different denominations are given in the Appendix.

76. The quantity of fluids is most easily ascertained by measurement, and the use of measures is in many cases sanctioned by the authority of the London and Dublin Colleges.

77. When, however, the specific gravity of fluids differs much from that of water, their quantity is directed by these Colleges to be determined by weight.

78. The errors arising from the promiscuous use of weights and measures have induced the Edinburgh College to reject the use of measures entirely, and to direct that the quantity of every fluid, as well as of every solid, shall be determined by troy weight.

79. For measuring fluids in dispensing medicines, the graduated glass measures are always to be preferred: they should be of different sizes according to the quantities they are intended to measure. Elastic fluids are also measured in glass tubes and jars, graduated by inches and their decimals.

80. The practice of administering active fluids by drops is very inaccurate. Not only do the drops of different fluids from the same vessel, and of the same fluids from different vessels, differ much in size; but it appears that the drops of the same fluid differ, even to the extent of a third, from different parts of the lip of the same vessel. The custom of dropping active fluids should, therefore, be abolished entirely; and, as weighing is too troublesome and difficult for general use, we must have recourse to small measures accurately graduated, in the manner of Lane's *drop* measure, and the *grain* measure recommended by the Edinburgh college; but we must not be misled by their names; for they are measures of bulk, not of drops or of grains.

81. In old times, pharmaceutists were contented with very rude methods of measuring some substances; such as, *manipulus*, a handful, and *pugillus*, a pinch, or as much as could be taken up by the thumb and two fore-fingers.

SPECIFIC GRAVITY.

82. Specific gravity is the comparative weight of equal bulks of different bodies. As a standard of comparison, distilled water at a certain temperature (62° Fahrenheit) has been generally assumed as unity.

83. The specific gravity of any solid heavier than water is ascertained, by comparing the weight of the body in the air with its weight when immersed and suspended in water. The quotient obtained by dividing its weight in air, by the difference between its weight in air and its weight in water, is its specific gravity.

84. When a solid is lighter than water, it must be rendered heavier by attaching to it a heavy solid. From the loss of weight which when united they sustain on being immersed in water, the loss of weight of the heavier alone is subtracted; the remainder expresses the loss of weight sustained by the lighter; and by dividing by this its weight in air, the quotient is the specific gravity of the lighter body.

85. The specific gravity of fluids may be ascertained by means of a small phial, called a weighing bottle; and by dividing its increase of weight when filled with the fluid to be examined, by its increase of weight when filled with distilled water, the specific gravity of the fluid is ascertained.

86. For the purpose of speedily ascertaining the specific gravity of fluids, bottles containing exactly 1000 grains of distilled water, with a brass weight equal in weight to the bottle, filled with distilled water, are extremely convenient. We

have only to fill the bottle with the fluid to be examined, and place it in one scale of the balance, with the counterpoise in the other; and the number of grains required to restore the equilibrium, being added to, or deducted from 1000, according as the fluid is heavier or lighter than water, will give the specific gravity.

87. Another method of ascertaining the specific gravity of fluid is by comparing the loss of weight of a solid body, such as a piece of crystal, when immersed and suspended in distilled water, with its loss of weight when immersed in the fluid we wish to examine; by dividing its loss of weight in the fluid, by its loss of weight in the water, the quotient is the specific gravity of the fluid. A balance adapted for this purpose is called a hydrostatic balance.

88. The specific gravity of gases and vapours is ascertained by the weighing bottle, but is an operation of great nicety, and never performed for pharmaceutical purposes.

89. Although these are the only general principles by which specific gravities are ascertained, yet as the manipulation is a work of great nicety, various ingenious instruments have been contrived to render the process and calculation easy, under the various appellations of hydrometers, gravimeters, alcoholimeters, saccharometers, &c., and sets of a series of beads adjusted to remain *in equilibrio* in fluids of different specific gravities, shew the weight of any fluid under trial by mere inspection.

90. The result is always influenced by the state of the thermometer and barometer at the time of the experiment; a standard for these is therefore assumed, and the trial must either be made at the standard temperature, or corrections must be made for any deviation from it at the time of making the experiment.

91. For important fluids, such as spirits and worts, upon which an excise duty is paid, and which must be examined at temperatures considerably different from 62°, sliding rules are manufactured for making these corrections by mere inspection.

92. It would be of material consequence to science and the arts, if specific gravities were always indicated by the numerical term expressing their relation to the specific gravity of distilled water. This, however, is unfortunately not the case. The excise in this country collect the duties paid by spirituous liquors, by estimating the proportion which they contain of a standard spirit, about 0.920 in specific gravity, which they call hydrometer proof; and they express the relation which spirits of a different strength have to the

standard spirit, by mentioning how many degrees they are above or under hydrometer proof.

93. The only other mode of expressing specific gravities which it is necessary to notice, is that of Baumé's areometer, as it is often used in the writings of the French chemists, and is little understood in this country. For substances heavier than water, he assumes the specific gravity of distilled water as zero, and graduates the stem of his instrument downwards, each degree being supposed by him to express the number of parts of muriate of soda contained in a given solution; which, however, is not at all the case. For substances lighter than water the tube is graduated upwards, and this zero is afforded by a solution of 1 of salt in 9 water. In the Appendix, tables are given of the specific gravities, corresponding with the degrees of both of these areometers.

94. The specific gravity of the gases and vapours differs so much from that of water, that water cannot be used as unity in regard to this class of substances; but philosophic chemists unfortunately have differed in their selection of a proper standard, some preferring atmospheric air, others hydrogen, and others oxygen.

MECHANICAL DIVISION.

95. Mechanical division is necessary on many occasions;

- *a.* To admit of certain definite quantities being taken from the whole.
- *b.* To promote chemical and therapeutical action.
- *c.* To give an appropriate form.

96. It is performed in different ways, and by different means, according to the different forms of aggregation and the end in view.

97. The forms of aggregation are,

- *a.* *Solid*, in which the attraction of cohesion resists relative motion among the particles, more or less perfectly, and the fragments are angular, and do not reunite on being placed in contact.

The chief varieties of this form of aggregation are,

- *aa.* Hard, affording sparks with steel, as flint.
- *bb.* Semihard, giving no sparks with steel, as marble.
- *cc.* Soft, easily cut by the knife, metals, lead, chalk, wood.
- *dd.* Very soft, yielding to the nail, succulent roots, animal substances.

- *b.* *Semifluid* or semisolid, intermediate between solid

and fluid; admitting of a certain degree of relative motion among the particles; fragments scarcely angular, and easily reunited by pressure.
aa. Plastic, as pill masses, plasters, ointments.
bb. Short, as electuaries.

c. *Fluid*, which admits of relative motion among the particles, with greater or less facility, and small portions of which have a tendency to assume a globular form, and readily reunite on coming into contact.
aa. Thin or limpid, alcohol, water, mercury.
bb. Thick or viscid, mucilage, honey, castor oil.

d. *Gaseous*, in which the particles repel each other.

98. Other physical properties influence the mechanical division of bodies, as tenacity, frangibility, and flexibility.

99. *Frangibility* is not the opposite of hardness. Glass is hard, and horn comparatively soft, but the former is much more frangible than the latter. The degrees of frangibility are expressed by common epithets.

a. Very difficultly frangible, as horn, nux vomica, raw coffee, iron-filings.
b. Difficultly frangible, as guaiac wood.
c. Moderately frangible, as roots, liquorice, rhatany.
d. Easily frangible; barks, roasted coffee.
e. Very easily frangible, as chalk.

100. *Tenacity* depends upon the degree of cohesion among the particles. In this point of view, bodies are,

a. Ductile; particles more or less moveable among themselves; may be extended by compression, or rolled out into a cylinder, as plasters and pill masses.
b. Sectile or mild; may be cut with a knife, without emitting a grating sound, or particles flying off; lustre increased on the streak; occurs in most organic substances, as wood, roots, horn, and in the soft and very soft minerals, as lead, graphite.
c. Brittle; particles entirely immoveable, and on cutting emit a grating sound, and fine particles fly off in the shape of dust; lustre diminished in the streak; occurs in all hard bodies, as glass, and in most semihard minerals, as marble.

101. *Flexibility* is possessed by those bodies which bend without breaking. Its kinds are,

a. Common flexibility, when the body remains in whatever position is given to it, as lead.
b. Elasticity, when, after being bent, it recovers its original position, as steel.
c. Elastic extensibility, as observed in caoutchouc.

102. The modes of overcoming the force of aggregation are very various.

- *a.* Cutting with a sharp edge.
  - *aa.* Slicing with a knife, as liquorice root.
  - *bb.* Shaving with a plane, as hartshorn.
  - *cc.* Turning on a lath, as ivory, guaiac wood.
  - *dd.* Clipping with scissars, or a knife and board.
  - *ee.* Splitting by wedges.
- *b.* Tearing into small fragments by a succession of wedges.
  - *aa.* Sawing,—marble, ivory, horn.
  - *bb.* Rasping, filing,—wood, iron.
  - *cc.* Grinding,—meal, flour.
  - *dd.* Friction on a sieve,—magnesia, carbonate of lead.
- *c.* Bruising or crushing.
  - *aa.* Trituration in flat mortars of glass, agate, or other hard materials, by giving a rotatory motion to the pestle, for dry, friable substances of an oily or resinous nature, which are apt to heat and soften by contusion.
  - *bb.* Porphyrization upon a slab of porphyry or other hard stone, by means of a muller of the same nature. The substance is always previously powdered and moistened with water or other fluid, so as to form a soft paste; and the object, which is to reduce it to an impalpable powder, is known to be complete, when a little rubbed between the fingers enters into the pores of the skin, and is not easily removed.
  - *cc.* Crushing beneath a heavy cylinder, rolled over the substance to be crushed, laid upon a hard floor or bed.
  - *dd.* Crushing between a pair of rollers, which may be either plain, as those for extending metal plates, or fluted, for crushing soft substances, as fruits.
  - *ee.* Bursting by mere compression with the hands, arms, feet, or machinery, chiefly used for obtaining the juice of fruits and berries, as grapes.
- *d.* Comminution by contusion is employed,
  - *aa.* To separate the fibres of very fibrous substances, as flax.
  - *bb.* To beat soft substances, as hemlock leaves or roots to a pulp.
  - *cc.* To reduce to powder all substances sufficiently brittle which do not cake under the pestle.

103. *Pulverization* is performed, either,

a. By machinery, as in stamping-mills for powdering mineral ores, or for vegetable powders, bark mills; or,

b. By the hand, sometimes assisted by machinery. For this purpose a pestle and mortar are employed, and the process is performed by repeated strokes of the pestle on the substance to be powdered, laid upon the bottom of the mortar.

104. The materials of which the pestles and mortars are formed, should resist both the mechanical and chemical action of the substances for which they are used. Wood, iron, marble, siliceous stones, porcelain, and glass, are all employed; but copper, and metals containing copper, are to be avoided. In the selection of materials, the general rule is, that they be sufficiently hard, and are not acted upon by the substances for which they are used.

105. The general form of a mortar is also various; deep, shallow, or flat. Of deep mortars, the bottom should be concave; and their sides should neither be so inclined as not to allow the substance operated on to fall to the bottom between each stroke of the pestle, nor so perpendicular as to collect it too much together, and thus to retard the operation.

106. Mortars generally should be provided with covers;

a. To prevent loss, from the finest and lightest parts escaping; and,

b. To defend the operator from the effects of disagreeable or noxious substances. But these ends are more completely attained, by tying a piece of pliable leather round the pestle, and round the mouth of the mortar. It must be closely applied, and at the same time so large, as to permit the free motion of the pestle.

107. In some instances, it will be even necessary for the operator to cover his mouth and nostrils with a wet cloth, or Gosse's sponge mask, and to stand with his back to a current of air, that the very acrid particles which arise may be carried from him.

108. The addition of a little water or spirit of wine, or of a few almonds, to very light and dry substances, will prevent their flying off. But almonds are apt to induce rancidity, and powders are always injured, by the drying which is necessary when they have been moistened. Water must never be added to substances which absorb it, or are rendered cohesive by it.

109. There are various means by which the process of pulverization may be facilitated.

- *a.* By operating on a proper quantity at a time; too little causes a great waste of labour; too much very greatly retards the operation. The separation from time to time, by means of a sieve, of what is sufficiently powdered, also facilitates the pulverization of what remains.
- *b.* By previous preparation; woods, roots, barks, should be previously cut, split, chipped, or rasped. Fibrous woods and roots should be finely shaved after their bark is removed, for otherwise their powders will be full of hair-like filaments, which can scarcely be separated.
- *c.* By attention to the temperature.
  - *aa.* Some metals, ductile at ordinary temperatures, become pulverizable at high temperatures. Zinc is pulverizable at 400°: but very malleable at 212°, and slightly so at 60°.
  - *bb.* Some earthy minerals crack and splinter and become pulverizable on being heated.
  - *cc.* Some substances are more frangible at an increased temperature, as tragacanth, nux vomica.
  - *dd.* Some become pulverizable at a low temperature, as resins, gum-resins, wax.
  - *ee.* All substances which contain water become pulverizable on being frozen, as muscular flesh.
- *d.* By state of moisture.
  - *aa.* Some substances have their tenacity reduced by being soaked in water; they scarcely, however, become friable, but may be bruised.
  - *bb.* All organic substances become more frangible by perfect exsiccation.
  - *cc.* All salts which contain much water of crystallization become more frangible by having it driven off.
- *e.* By means of certain additions.
  - *aa.* Alcohol, as to camphor.
  - *bb.* Water, some orchis roots are first wetted and then dried.
  - *cc.* Tragacanth mucilage—squill, colocynth and viper's flesh, may be powdered after being soaked in this, and again dried.
  - *dd.* Some dry meagre powders; vanille and mace may be rubbed to powder with sugar.

110. In general, all impurities and inert parts having been previously separated, the operation must be continued and repeated upon vegetable substances till no residuum is left.

The powders obtained at different times must then be intimately mixed together, so as to bring the whole to a state of perfect uniformity. But in some instances a preference is given to the powder obtained at different periods of the process, though upon doubtful grounds.

a. Of cinchona and cascarilla, the first portion obtained is directed to be rejected, as furnished by the epidermis and lichens adhering to it, and the last is preferred as being more resinous.

b. Of liquorice and althæa root, the first portion is preferred, and the last rejected as being too fibrous.

c. Of jalap, rhubarb, gentian, elecampane, cinnamon and Winter's bark, the whole is preserved.

111. *Granulation* is employed for the mechanical division of some fusible substances. It is performed by agitating the substance in its passage from a fluid to a solid state;

a. By stirring with rods, as sub-carbonate of potass, sugar, tin.

b. By shaking along with a substance to keep the grains divided,—phosphorus, tin.

c. By pouring through a cullender, into water, or from a great height,—common and patent shot.

112. Pulverization is sometimes effected by chemical means.

a. By the addition of water, as in the slaking of lime.

b. By the abstraction of water, as in the efflorescent, or more properly deaquescent, salts.

MECHANICAL MIXTURE.

113. Mechanical mixture is often employed to mingle bodies of all forms of aggregation with others of the same form or of different forms.

a. Of dry powders with each other, by stirring and trituration; as in the formation of all compound powders. It is most effectually done by passing the mixed powders through a sieve.

b. Of dry with soft substances, as in the formation of pill masses, by beating and kneading dry powders with fluid extracts, or in mixing powders with plasters and ointments.

c. Of soft substances with each other, by beating and kneading extracts and fluid resins with each other.

d. Of dry with fluid—diffusion and suspension, by gradually adding the fluid to the powder, and rubbing them together, as in making the chalk mixture, suspending magnesia or camphor in mixtures.

- *e.* Of soft with fluid, by adding the fluid gradually and rubbing, as in making emulsions, assafœtida or ammoniac mixture.
- *f.* Of fluid with fluid, by agitation in a phial; as in strongly shaking together oil of turpentine and water.

MECHANICAL COMBINATION.

114. Mechanical combination is when, by mechanical means, substances are made to act chemically on each other; as when sulphate of copper is triturated with carbonate of ammonia, or acetate of lead with sulphate of zinc; or oil is combined by agitation with lime-water or liquid ammonia.

MECHANICAL SEPARATION.

115. By mechanical means we are often enabled to separate from each other substances only mechanically mingled.

Solids are separated from solids in various ways.

- *a.* Finer from coarser powder of the same kind. Sifting, tamisation, (*cribration*, M. Henry.)
- *b.* Round from ill-shaped grains; as in lead shot.
- *c.* Lighter from heavier powders of different kinds:
  1. Winnowing.
  2. Separation of metallic from earthy particles.
  3. Elutriation.
- *d.* Iron-filings from other powders by means of a magnet.

116. *Sifting.*—Powders of different degrees of fineness are separated,

- *a.* For the sake of the finer powder in most instances;
- *b.* For the sake of the coarser powder, as in the making of *Species.*

117. It is performed by a sieve; the finer powder being made to pass through its interstices, while the coarser powder is retained.

118. The materials of which sieves are composed are very various.

- *a.* Metals; iron, copper, brass, silver.
- *b.* Wood, chip, split cane, hempen, linen or cotton cloth.
- *c.* Leather pierced with holes, split whalebone, haircloth, silk, *(tamis)*.

119. Sieves are of various degrees of fineness, according to the purpose for which they are used.

- *a.* Coarse; called screens, riddles.
- *b.* Fine; sieves, searces, bolters.

120. A sieve consists essentially of the sifting material, attached to a frame, which determines its form. The frame is sometimes square, but most commonly a cylindrical hoop, over one end of which the sifting material is stretched. In bolting mills it is wrapped around an open cylindrical frame.

121. Compound sieves have a close lid and receiver, so that nothing, either valuable or deleterious, can escape.

122. Dusting bags are formed of the sifting material, and are generally inclosed in a very close box, which serves as a receiver for the fine powder which is shaken through the bag.

123. The manipulation by which the fine powder is made to pass through the sieve is various: The sieve itself is generally shaken gently to and fro, sometimes struck upon a hard body; or if the sifting material be formed into a cylinder, it is either whirled round upon its axis, or it is left at rest, and the fine powder forced through by means of brushes carried round within it upon an axis.

124. *Elutriation* (*Dilution*, M. Henry) is a species of sifting. Its object is to separate fine powders from coarse; of light from heavy.

125. The process depends on the property that very fine or light powders have of remaining for some time suspended in water; it is performed by diffusing the powder or paste formed by levigation through much water, letting it stand a sufficient time, until the coarser particles settle at the bottom, and then pouring off the liquid in which the finer or lighter particles are suspended. The fine powder which is washed over with the water is procured by allowing it to subside completely, and by decanting off the water very carefully. Fresh water may be poured on the residuum, and the operation repeated; or the coarser particles which fall to the bottom may be previously levigated a second time. When the levigated powder is formed into small conical masses and dried, the process is called *trochiscation* by the French pharmaceutists.

126. It is performed on substances upon which water has no chemical action.

a. For the purpose of freeing a heavy powder from all lighter foreign particles and impurities; in which case it is said to be washed; used for preparing granulated tin, and often in metallurgy.

b. For the purpose of freeing impalpable powders obtained by trituration and levigation, from the coarser particles; used for all prepared powders, either earthy, as chalk,—or metallic, as sulphuret of antimony, carbonate of iron, &c.

127. Solids are separated from fluids *(Clarification,* Chevallier), by

- *a. Deposition, (Depuration,* M. Henry,) or allowing them to subside. This process can only be employed when there is no tendency in the mixture to decomposition. The supernatant fluid is then separated by
  - *aa. Decantation,* which is very frequently made use of for separating the clear from the turbid part of a fluid, and for separating fluids from solids which are specifically heavier, especially when the quantity is very large, or the solid so subtile as to pass through the pores of most substances employed for filtration, or the liquid so acrid as to corrode them.
  - *bb.* By drawing it off by a *pipet,* syringe or pump, or syphon, which again may be either simple or compound.
  - *cc.* By capillary threads, which is a species of filtration *pèr ascensum.*
- *b.* By *filtration,* which is employed when the powder either does not subside at all, or too slowly and imperfectly for decantation.

128. There are two modes of filtration:

- *a. Per descensum;* the common method in which the fluid passes downwards through the filter, and of course through the powder deposited upon it.
- *b. Per ascensum;* in which the fluid and the powder are made to take opposite directions, as in the filtering fountain.

129. In regard to filters, strainers and drainers, the circumstances to be attended to are the material, form, size, weight and support.

130. The materials of which filters are made should, as much as possible,

- *a.* Resist the chemical action of the substances for which they are to be used;
- *b.* Be sufficiently porous to allow the fluid to pass readily, and yet sufficiently close to retain the finest powder;
- *c.* Not absorb much of the fluid.

131. Metallic filters or strainers are made of iron, tinplate, copper, brass or silver. In form, they are either plates pierced with small holes, or wire woven into cloth. They are not close in the pores, and are apt to be acted upon by acids, but they do not absorb.

132. Earthy materials are also used. Strainers are made

of Wedgwood's ware, and Bristol ware. Sand, porous stone and artificial stone will serve as filters; they however are porous, and apt to get foul. Sand and pounded glass, also charcoal, are employed in compound filters.

133. Many vegetable substances are used. Wood is employed for mercury. Fats, resin and wax are strained through straw, hemp or flax. Linen, hemp and cotton cloth or muslin are very frequently employed; but for obtaining very limpid fluids, unsized colourless paper and well-washed must be used.

134. Animal substances are also employed. Hair, wool, silk, commonly woven into cloth; also leather and sponge are adapted to some cases.

135. The form of filters is either more or less flat and stretched; or a conical bag, often called Hippocrates's sleeve. Paper is folded so as to form a cone, and, as much as possible, a ribbed cone, of equal thickness in every part.

136. The size must be adapted to the quantity to be filtered. When large, filters absorb too much, and are apt to be burst by the weight of the liquid put into them. Large quantities must be filtered by repetitions of the process. When very small, the operation is tedious, as a certain weight of fluid is required to force the pores.

137. In very accurate experiments, it is necessary to ascertain exactly the weight of the filter, before commencing the process.

138. In most cases a frame and support are necessary. Cloth and leather filters are often attached to a hoop or square frame, or they may be put into a wicker cone. Paper is placed in a funnel, or spread on the inside of a flannel bag. Ribbed funnels expedite the operation, or glass rods or straws may be placed between the paper and funnel. In some cases inconvenience arises from the capillary attraction of the paper, especially when it does not reach to the edge of the funnel. This may be obviated by dipping the edge of the paper in melted tallow.

139. What passes through first is seldom fine enough, and must be poured back again, until by the swelling of the fibres of the filter, or filling up of its pores, the fluid acquires the requisite degree of limpidity. Charcoal powder is a useful addition to muddy and deep coloured liquors. The filtration of some viscid substances is much assisted by heat.

140. Stands for suspending the funnels and filters are necessary, as, when full, they are easily overturned; and, in many cases, covers are required, not merely to keep out the

dust, but to prevent the access of the air, as in filtering caustic ley.

141. Many compound and complicated filtering apparatuses have been invented.

142. *Expression* is a species of filtration, assisted by mechanical force. It is employed,

- *a.* For the sake of the fluid expressed;
  - *aa.* Recent vegetable juices.
  - *bb.* Fixed oils; linseed, almond, castor, croton oils; tallow, lard.
  - *cc.* Volatile oils; lemon, bergamot.
  - *dd.* Infusions, decoctions, chemical solutions.
- *b.* For the sake of the residuum.
  - *aa.* To dry spongy precipitates, as in preparing sulphate of quinia.
  - *bb.* Elaterium, cheese.

143. Some preliminary operations are commonly necessary.

- *a.* Mechanical comminution, by cutting, rasping, bursting, crushing, to open the cells in which fluids are contained in fresh vegetables.
- *b.* A certain degree of heat to render fixed oils more fluid. For unctuous seeds iron plates are used; and it is customary not only to heat the plates, but to warm the bruised seeds in a kettle over the fire, after they have been sprinkled with water, as by these means the product is increased, and the oil obtained is more limpid. But as the oils procured in this way are more disposed to rancidity, this process should either be laid aside altogether, or changed to exposing the bruised seeds, inclosed in a bag, to the steam of hot water.

144. Vegetables intended for this operation should be perfectly fresh, and freed from all impurities. In general they should be expressed as soon as they are bruised, for after this they are disposed to ferment; but subacid fruits give a larger quantity of juice, and of finer quality, when they are allowed to stand some days in a wooden or earthen vessel after they are bruised. To some vegetables which are not juicy enough, the addition of a little water is necessary; but it is said to alter the nature of the extracts thus obtained. Lemons and oranges must be peeled or pared, as their skins contain a great deal of essential oil, which would mix with the juice.

145. Except some fruits, especially those of considerable size, such as lemons and oranges, of which the juice may

be squeezed directly from the skins or husks, vegetable pulps are inclosed in a bag, through which the juice is to be squeezed by the action of a press. The bags should be of hair-cloth, or canvas inclosed in hair-cloth. Hempen and woollen bags are apt to give vegetable juices a disagreeable taste.

146. The mechanical force used for expression may be,

- *a.* Merely manual, as we express the oil from lemon peel, or the juice from grapes and various berries.
- *b.* Manual aided by a simple instrument, as in the hinged and conical lemon squeezers.
- *c.* More powerful machinery.
  - *aa.* The common screw-press, with plates of wood, iron or tin.
  - *bb.* Box screw-press.
  - *cc.* Ruthven's eccentric wheel press.
  - *dd.* Hydrostatic press. Bramah's, Real's, Römershausen's.
  - *ee.* By wedges to give sudden pressure, as in the oil press.
  - *ff.* By percussion, as in Revillon's press.

  In all these cases the pressure should be gentle at first, and increased very gradually.

147. *Clarification* (*Coagulation*, M. Henry) is a species of filtration. It is performed,

- *a.* Without addition, when the liquor contains a principle coagulable by heat. This, on heating the liquid sufficiently, separates and carries up all impurities with it, in the form of scum.
- *b.* By adding coagulable substances, as by mixing with the liquor, when cold, white of egg well beaten with a little water. This also on being heated coagulates, and rises to the surface, carrying with it all the impurities. The liquor may now be filtered with ease, or may be skimmed with a perforated ladle.

Spiritous liquors are clarified, without the assistance of heat, by means of isinglass dissolved in water, or of any albuminous fluid, as milk, which coagulates from the action of alcohol.

Some expressed juices, as those of the antiscorbutic plants, are instantly clarified by the addition of any vegetable acid, as the juice of bitter oranges, which throws down coagulable matter.

148. Fluids can be separated from each other only when they have no tendency to combine, and when they differ in specific gravity. The separation may be effected by skim-

ming off the lighter fluid with a silver or glass spoon, (*Despumation*, M. Henry); or by drawing it off by a pipet, syringe or syphon; or by means of a glass separatory, which is an instrument having a projecting tube rising from the bottom, and terminating in a very slender point, through which the heavier fluid alone is permitted to run; or by means of the capillary attraction of a spongy woollen thread, previously soaked with the lighter fluid, for no fluid will enter a substance whose pores are filled by another, for which it has no attraction; and, lastly, upon the same principle, by means of a filter of unsized paper, previously soaked in the heavier fluid, which in this way readily passes through it, while the lighter remains behind.

APPARATUS.

149. Before entering on the chemical operations, it will be necessary to make a few remarks on the instruments employed in performing them. They may be divided into,

- *a.* The vessels in which the effects are performed;
- *b.* Fuel, or the means of producing heat; and
- *c.* The instruments for applying and regulating the heat; or lamps and furnaces.

VESSELS.

150. The vessels, according to the purposes for which they are intended, vary,

- *a.* In form; and
- *b.* In materials.

151. The ingenuity of chemists has been exercised in multiplying the forms of their apparatus, which are often very complex. But the elementary forms are not numerous, although they are not often employed without some modification. They may be divided into,

- *a.* Solid;
  1. Spheroid; shot, ball; often attached as knobs to jars; also the heads of pestles;
  2. Cylinder; rod or wire of different diameters and lengths, of all materials, in very frequent use;
  3. Cones, of different degrees of acuteness; mullers, conical stoppers;
  4. Prisms, with parallel and converging sides;
  5. Discs, plates, either circular or prismatic, often used as the covers or forming the bottoms of containing vessels.

b. Hollow:

1. Spheroidal or globular; seldom used complete and simple, but often in segments, as evaporating dishes, and in combination.
2. Tubular, which may be,
   aa. Straight;
   bb. Bent, as the syphon;
   cc. Sigmoid, as the bent tube.
   The tube may have either both ends open, or one end closed, as in test-tubes.

c. Cylindrical, which is only a wide tube, generally with one end closed by a flat or spherical surface; jars.

d. Conical, of very various degrees of acuteness, commonly truncated; round crucibles, solution glasses, glass measures, dishes, pans.

e. Prismatic; triangular crucibles.

152. The primary combinations of these shapes are,

a. The spheroido-tubular, the common ballon or receiver, of which the bottom is sometimes plane or indented.

b. The spheroido-cylindrical, the boiler;

c. Spheroido-conical, the matrass;

d. Tubo-cylindrical, or tubo-prismatic, the common medicinal phial, generally furnished with a reflected lip.

e. Tubo-conical, the funnel.

f. Cylindro-conical, the champaigne bottle.

153. No substance possesses properties which render it fit to be employed as a material in every instance. We are therefore obliged to select those substances which possess the properties more especially required in the particular operations for which they are intended.

154. The properties most generally required are,

a. The power of resisting chemical agents. No substance possesses it absolutely: Glass is acted upon by strong caustic ley and fluoric acid; if it contain much lead it becomes very fusible, and the lead is reduced by great heat. The glazing of common earthen ware is acted upon by acids. Iron is acted upon by most acids and many saline solutions. Copper and brass are dangerous.

b. Transparency, possessed only by glass.

c. Compactness; possessed by metals, glass, and fine porcelain; defective in unglazed and coarse earthen ware, and in wood.

d. Strength; possessed by metals and thick porcelain; defective in glass and soft earthen ware.

e. Incombustibility; possessed by earthen ware and most metals; copper and brass oxidize and scale by heat.

f. Fixity; possessed by all metals, earthen ware and glass.

g. Infusibility; possessed by earthen ware, (unless acted upon at the same time by chemical agents,) green glass, platinum, iron, gold, silver, copper; defective in lead, tin, pewter.

h. And the power of bearing sudden variations of temperature without breaking; defective in glass.

155. The metals in general possess the last six properties in considerable perfection, but they are all opaque. Iron and copper are apt to be corroded by chemical agents, and the use of the latter is often attended with dangerous consequences. These objections are in some measure, but not entirely removed by tinning them. Tin and lead are too fusible. Platinum, gold, and silver, resist most of the chemical agents, but their expense is an insurmountable objection to their general use.

156. Good earthen ware resists the greatest intensity of heat, but is opaque and deficient in strength. The basis of all kinds of earthen ware is clay, which possesses the valuable quality of being very plastic when wrought with water, and of becoming extremely hard when burnt with an intense heat. But it contracts so much by heat, that it is very apt to crack and split in baking; it is therefore necessary to add some substances which may counteract this property. Siliceous sand, clay burnt with an intense heat, and then reduced to powder, and plumbago, are occasionally used. These additions, however, are attended with other inconveniences; plumbago, especially, is liable to combustion, and sand diminishes the compactness, so that it becomes necessary to glaze most kinds of earthen ware; but the glazes commonly employed are acted upon by chemical agents. The vessels manufactured of Wedgwood's mortar-ware are the best of this description, except those of porcelain, which are very expensive.

157. Glass possesses the three first qualities in an eminent degree, and may be heated red hot without melting. Its greatest imperfections are its brittleness and disposition to crack, or break in pieces, when suddenly heated or cooled. As this is occasioned by its unequal expansion or contraction, glass vessels should be made very thin, and of a round form. They should also be well annealed, that is, cooled very slowly, by placing them immediately in a heated oven, while they are

yet in a soft state after being blown. When ill annealed, or cooled suddenly, glass is apt to fly in pieces on the slightest change of temperature, or touch of a sharp point. We sometimes take advantage of this imperfection; for by means of a red-hot wire, charcoal, or bit of a tobacco pipe, glass-vessels may be cut into any shape. When there is not a crack already in the glass, the point of the wire is applied near the edge, a crack is formed, or the crack may be begun by scratching the surface with a sharp file, which is afterwards easily led in any direction.

158. Reaumur's porcelain is glass, which has been exposed to an intense heat, surrounded with hot sand, and allowed to cool so slowly, that it assumes a crystalline texture, which destroys its transparency, but imparts to it every other quality wished for in chemical vessels. The coarser kinds of glass are commonly used in making it; but as there is no manufacture of this valuable article, its employment is very limited.

LUTES.

159. Lutes are a necessary part of chemical apparatus. They are used for various purposes:

- *a.* For the temporary union of vessels, to prevent the escape of vapour, and exclude air. Lutes.
- *b.* For the permanent union of vessels, and mending fissures. Cements.
- *c.* For protecting glass vessels against the inconvenient effects of heat. Coatings.
- *d.* For lining furnaces.

160. Lutes in general should possess the following properties:

- *a.* Viscidity, plasticity, cohesion, and compactness;
- *b.* The power of resisting acrid vapours;
- *c.* The power of resisting certain degrees of heat.
- *d.* In many cases facility of removal.

These properties are possessed in very different degrees by the several materials commonly used for making lutes, as potter's clay, lime, chalk, linseed meal, flour, wax, oil, paper, linen, tow, bladder, &c.

161. Lutes may be considered as,

- *a.* Unctuous or resinous;
- *b.* Mucilaginous;
- *c.* Earthy.

162. Unctuous lutes possess the two first class of properties in an eminent degree; but they are in general so fusible,

that they cannot be employed when they are exposed to heat, and they will not adhere to any substance that is at all moist. Examples,

a. Eight parts of yellow wax, melted with one of oil of turpentine, with or without the addition of resinous substances, according to the degree of pliability and consistence required. Lavoisier's lute.

b. Four parts of wax, melted with two of varnish * and one of oil. Saussure's lute.

c. Caoutchouc dissolved in melted spermaceti.

d. Mastiche dissolved in the smallest quantity of alcohol, incorporated with a strong spiritous solution of glue, with which some bits of galbanum or gum ammoniac have been triturated.

e. Tincture of shell lac mixed with solution of isinglass in proof spirit.

f. Three parts of finely powdered clay, beat into a paste, with one of drying oil †, or, what is better, amber varnish. Fat lute.

g. Chalk and drying oil, or glazier's putty, is well fitted for luting tubes permanently into glass vessels, for it becomes so hard that it cannot be easily removed.

h. Equal parts of litharge, quicklime, and powdered clay, worked into a paste with oil varnish, is sometimes applied over the cracks in glass vessels, so as to fit them for some purposes.

i. Melted pitch and brick dust.

k. Four parts of rosin melted with one of yellow wax, with one part of fine brick-dust stirred into it.

163. Mucilaginous substances, such as flour, gum, and glue, mixed with water, and albuminous substances, as white of egg, are sufficiently adhesive, are dried by moderate degrees of heat, and are easily removed after the operation, by moistening them with water, but a high temperature destroys them, and they do not resist corrosive vapours. The addition of an insoluble powder is often necessary to give them a sufficient degree of consistency. Examples,

a. Slips of bladder softened in water, and applied with the inside next the vessels. They are apt, however, from their great contraction in drying, to break weak vessels.

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* Made by melting yellow amber in an iron ladle, and mixing it with linseed oil.

† Drying oil is prepared by boiling 22.5 parts of litharge in 16 of linseed oil until it be dissolved.

b. One part of gum-arabic with six or eight of chalk, formed into a paste with water.

c. Flour worked into a paste with clay dried and powdered, or chalk.

d. Almond or linseed meal formed into a paste with mucilage or water.

e. Quicklime in fine powder, hastily mixed with white of egg, and instantly applied, sets very quickly, but becomes so hard that it can scarcely be removed.

f. Slaked lime in fine powder, with glue, does not set so quickly as the former.

g. The cracks of glass vessels may be cemented by daubing the crack and a suitable piece of linen with white of egg, strewing both over with finely powdered quicklime, and instantly applying the linen closely and evenly.

164. Earthy lutes resist very high temperatures, but they become so hard that they can scarcely be removed, and often harden so quickly after they are mixed up, that they must be applied immediately. Examples,

a. Quicklime well incorporated with a sixth part of muriate of soda, applied on slips of linen.

b. Burnt gypsum, made up with water, sets quickly.

c. One ounce of borax dissolved in a pound of boiling water, mixed with a sufficient quantity of powdered clay. Mr Watt's fire lute.

d. One part of clay with four of sand, formed into a paste with water. This is also used for coating glass vessels, in order to render them stronger, and capable of resisting intense heat. It is then made into a very thin mass mixed with chopt hair, and applied in successive layers, taking care that each coat be perfectly dry before another be laid on.

e. Six parts of clay, with one of iron-filings, made into a paste with oil.

165. The lutes for lining furnaces will be described when treating of furnaces.

166. In the selection of lutes, attention must be paid to the chemical nature of the vapour to be confined.

a. Aqueous vapour is confined by resinous, waxy, and oily lutes, but not by lutes whose viscidity depends on mucilage, or other substances soluble in water.

b. For the vapour of alcohol, ether, and the volatile and empyreumatic oils, the mucilaginous and earthy lutes are fit; the resinous unfit.

c. For acid vapours, the resinous, waxy and oily are fit; the earthy unfit.

d. For ammoniacal vapour, the earthy are fit; organic matter unfit.

167. The junctures of vessels which are to be luted to each other should previously be accurately and firmly fitted, by introducing between them, when necessary, short pieces of wood or cork, or, if the disproportion be very great, by means of a cork fitted to the one vessel, having a circular hole bored through it, through which the neck of the other vessel or tube may pass, or by wrapping wet tow around it.

168. After being thus fitted, the lute is either applied very thin, by spreading it on slips of linen or paper, and securing it with thread; or if it is a paste lute, it is formed into small cylinders, which are successively applied to the junctures, taking care that each piece be made to adhere firmly and perfectly close in every part before another is put on. Lastly, the whole is secured by slips of linen or bladder.

169. In some cases, to permit the escape of elastic vapours, a small hole is made through the lute with a pin, or the lute is perforated by a small quill, fitted with a stopper. But the same end is better attained by using a tubulated receiver.

170. There are other modes of rendering the junctures of vessels tight, besides covering them with lute. On many occasions this is effected by grinding the neck of the one into that of the other, and also very frequently by immersing the mouth or orifice into water or mercury, the column of which must be overcome before any communication can take place between the contents of the vessels and the atmosphere.

HEAT AND FUEL.

171. As caloric is an agent of the most extensive application in the chemical operations of pharmacy, it is necessary that we should be acquainted with the means of employing it in the most economical and efficient manner.

172. The rays of the sun are used in the drying of many vegetable substances; and the only attentions necessary are to expose as large a surface as possible, to allow the vapour to escape readily, and to turn them frequently, that every part may be dried alike. The heat of the sun is also sometimes used for promoting spontaneous evaporation.

173. The combustion of fuel is the common source of heat for pharmaceutical purposes.

174. Fuel is either,

- *a.* Gaseous,—hydrogen and carburetted hydrogen.
- *b.* Fluid.
  - *aa.* Volatile without decomposition, alcohol, naphtha, volatile oil.
  - *bb.* Fixed,—vegetable oil, fish oil.
- *c.* Solid.
  - *aa.* Fusible,—spermaceti, wax, tallow.
  - *bb.* Infusible, inflammable, wood, turf, coal.
  - ——— uninflammable, charred wood, turf, coal.

175. The combustible principles in all these fuels are hydrogen and carbon. When they contain little hydrogen, they burn without flame or smoke, becoming merely incandescent, as charcoal, coke, blind coal. For the production of flame, the fuel must be in the state of gas or vapour, and smoke and soot are owing to the imperfect combustion of carbonaceous particles.

176. Hydrogen gas burns with a blue flame, giving out little light, but a very intense heat, especially if burnt with oxygen, as in Newmann's blowpipe.

177. Carburetted hydrogen, whether the lighter variety, coal gas, or the heavier variety, oil gas, are now in common use for the production of heat and light, the former yielding proportionally more heat, the latter more light.

178. It has not been as yet ascertained what is the most advantageous method of burning gas as a source of heat. But from some experiments made by myself, the heat generated seemed to be the same, whether it was burnt in the usual method, or upon a wire-gauze burner, after being mixed with atmospheric air. In the latter method, however, the heat was more diffused.

179. As a fuel, gas possesses some peculiar advantages, especially for processes on a small scale.

- *a.* It may be conveyed to any situation by means of pipes.
- *b.* It may be continued any length of time very steadily, at any degree between its *minimum* and *maximum.*

180. Its defects are,

- *a.* Want of intensity for certain purposes, or rather of quantity for operations on a considerable scale.
- *b.* Its being too much concentrated, so that vessels of some size exposed to it are very unequally heated. This inconvenience may in some measure be remedied by using a number of single jets, or by burning it, according to a method invented by myself, upon a wire-gauze burner or grate.

181. Fluid combustibles, such as alcohol, naphtha, oil, and melted wax, spermaceti, and tallow, can only be burnt on porous wicks, which draw up a portion of the fluid to be volatilized and inflamed. Fluid inflammables are therefore burnt in lamps of various constructions, and solid fusible inflammables may be made into candles. But although commonly used to produce light, they also afford an uniform, but not high temperature. This may however be increased by increasing the number and size of the wicks. Alcohol and naphtha produce a steady heat, no smoke, and, if strong, leave no residuum. Oil gives a higher temperature, but on a common wick produces much smoke and soot. These are diminished, and the light and heat increased, by making the surface of the flame bear a large proportion to the centre; which is best done by a cylindrical wick, so contrived that the air has free access both to the outside and inside of the cylinder, as in Argand's lamp, invented by Mr Bolton of Birmingham. In this way, oil may be made to produce a considerable temperature, of great uniformity, and without the inconvenience of smoke.

182. Lamps are also improved by adding a chimney to them. It must admit the free access of air to the flame, and then it increases the current, confines the heat, and steadies the flame. The intensity of the temperature of flame may be greatly increased, by forcing a small current of air, especially if heated, through it, as by the blowpipe.

183. Wicks have the inconvenience of being charred by the high temperature to which they are subjected, and becoming so clogged as to prevent the fluid from rising in them. They must then be trimmed; but this is less frequently necessary with alcohol and fine oils than with the coarser oils. The charring of the wick is also prevented by contrivances to maintain the surface of the oil at the same level, as in the lamps manufactured by MM. Gagneux, Carcelles and others. Incombustible wicks, made of asbestus or spun glass, have been lately introduced for alcohol or naphtha.

184. Wood, turf, coal, charcoal, and coke, solid combustibles, are burnt on grates and in furnaces.

185. Wood has the advantage of kindling readily, but affords a very unsteady temperature, is inconvenient from its flame, smoke, and soot, and requires much attendance. The heavy and dense woods give the greatest heat, burn longest, and leave a dense charcoal.

186. Dry turf gives a steady heat, and does not require so much attention as wood; but it consumes fast, its smoke

is copious and penetrating, and the empyreumatic smell which it imparts to every thing with which it comes in contact, adheres to them with great obstinacy. The heavy turf of marshes is preferable to the light surface turf.

187. Coal is the fuel most commonly used in this country. Its heat is considerable, and sufficiently permanent, but most kinds of it produce much flame and smoke.

188. Charcoal, especially of the dense woods, is a very convenient and excellent fuel. It burns without flame or smoke, and gives a strong, uniform, and permanent heat, which may be easily regulated, especially when it is not in too large pieces, and is a little damp. But it is costly, and burns quickly.

189. Coke, or charred coal, possesses similar properties with charcoal; it is less easily kindled, but is capable of producing a higher temperature, and burns more slowly.

190. An open grate will serve for many pharmaceutical operations. Digestion may be performed on the hod of a Bath stove, and decoction over an open fire, but the grate should be furnished with cranes or trivets to support the vessels, that they may not be overturned by the burning away of the fuel. Hot closets and boilers are easily and often attached to open grates.

191. For small operations and experiments, gas burners, and spirit, oil or tallow lamps will serve. The chauffer with parallel sides, which is in fact the body of a furnace, is very convenient on many occasions, and its power may be greatly increased by covering it with a dome and chimney.

FURNACES.

192. In all furnaces, the principal objects are, to produce a sufficient degree of heat, with little consumption of fuel, and to be able to regulate the degree of heat.

193. An unnecessary waste of fuel is prevented by forming the sides of the furnace of very imperfect conductors of caloric, and by constructing it so that the subject operated on may be exposed to the full action of the fire.

194. The degree of heat is regulated by the quantity of air which comes in contact with the burning fuel. The quantity of air is in the compound ratio of the size of the aperture through which it enters, and its velocity. The velocity may be increased by mechanical means, as by bellows, or by increasing the height and width of the chimney.

195. The essential parts of a furnace are,

a. A body for the fuel to burn in;

b. A grate for it to burn upon ;
c. An ash-pit to admit air and receive the ashes ;
d. A chimney for carrying off the smoke and vapours.

196. The ash-pit should be perfectly close, except the door, which should be furnished with a register plate, to regulate the quantity of air admitted.

197. The bars of the grate should be square or triangular, and placed with an angle pointed downwards. The distance of the bars, and their mode of fixture, depend upon the nature of the fuel and size of the furnace. In small furnaces they should not be above half an inch distant ; and the grate should be fixed on the outside of the body.

198. The body may be cylindrical or elliptical, with apertures for introducing the fuel and the subjects of the operation, and for conveying away the smoke and vapours.

199. The forms of furnaces have been infinitely varied, either by the caprice of chemists, or to adapt them to certain specific purposes, or to suit them to many purposes, which generally injures them for all.

a. When the combustion is supported by the current of air naturally excited by the burning of the fuel, it is called a wind furnace ;
b. When it is accelerated by increasing the velocity of the current by bellows, it forms a blast-furnace ;
c. When the body of the furnace is covered with a dome, which terminates in the chimney, it constitutes a reverberatory furnace. The chimney may rise either from the centre of the dome, or may be at one end, and the fire place at the other, as in calcining furnaces.

200. Furnaces are either fixed, and built of fire-brick, or are portable, and fabricated of plumbago, earthen-ware, plate-iron. When of iron, they must be lined with some badly conducting and refractory substance, both to prevent the dissipation of heat, and to defend the iron against the action of the fire. Dr Black employed two different coatings. Next to the iron, he applied a composition of three parts by weight of charcoal, and one of fine clay, first mixed in the state of fine powder, and then worked up with as much water as permitted the mass to be formed into balls, which were applied to the sides of the furnace, and beat very firm and compact with the face of a broad hammer, to the thickness of about one inch and a half in general, but so as to give an elliptical form to the cavity. Over this, another lute, composed of six or seven parts of sand, and one of clay, was applied, in the same manner, to the thickness of about half an

inch. These lutes must be allowed to become perfectly dry before the furnace is heated, which should at first be done gradually. A mixture of scales of iron and powdered tiles, worked up with blood, hair, and clay, is said to be less apt to split and crack when exposed at once to a violent heat than when dried gradually, according to the common directions. Furnaces may also be lined with fire bricks of a proper form, accurately fitted and well cemented together before the top-plate is screwed on.

201. The general fault of furnaces is, that they admit too much air, which prevents us from regulating the temperature. The fire either becomes too violent and unmanageable, or, when more cold air is admitted than what is necessary for supporting the combustion, the heat is carried off, and the temperature cannot be raised sufficiently. The superior merit of Dr Black's furnace consists in the facility with which the admission of air is regulated; and every attempt hitherto made to improve it, by increasing the number of its apertures for particular purposes, have in reality injured it.

202. Heat may be applied to vessels employed in chemical operations,

a. Directly, as in the open fire and reverberatory furnace;
b. Or through the medium of sand; the sand-bath;
c. Of water; the water-bath;
d. Of steam; the vapour-bath; steam apparatus;
e. Of air; as in the muffle; hot closet.

CHEMICAL OPERATIONS.

203. Although, in all chemical operations, combination takes place, and there are very few of them in which decomposition does not also occur; yet, for the sake of method, we shall consider them as principally intended to produce,

a. Change in the form of aggregation *;
b. Combination;
c. Decomposition.

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* The change of the form of aggregation is commonly preceded by expansion or contraction. Bodies differ very much in the degree of gradual expansion, which equal increments of temperature produce in them. Gases and vapours are more expansible than fluids, fluids than solids. The individuals of the two last forms of aggregation also exhibit considerable differences. All gases and vapours expand alike.

204. The degree of aggregation is diminished * by
a. Liquefaction; fusion;
b. Vaporization.

205. It is increased by,
a. Condensation;
b. Congelation;
c. Coagulation.

206. *Liquefaction* † is commonly used to express the melting of substances, as tallow, wax, resin, &c. which pass through intermediate states of softness before they become fluid. In pharmacy liquefaction is employed in the preparation of most of the plasters and ointments.

207. *Fusion* ‡ is the melting of substances which pass immediately from the solid to the fluid state, as many salts and most of the metals. Substances differ very much in fusibility; some, as water and mercury, existing as fluids in the ordinary temperatures of the atmosphere; while others, as the pure earths, are scarcely fusible. In pharmacy, examples of fusion occur in the melting of sulphur, acetate of potass, alum, and various metallic preparations.

208. When a substance acquires by fusion a degree of transparency, a dense uniform texture, and great brittleness, and exhibits a conchoidal fracture, with a specular surface, and the edges of the fragments very sharp, it is said to be *vitrified.* Example, Glass of antimony.

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* MM. Henry and Guibourt have made the following observations on the term *Disaggregation,* or separation of particles:—"Caloric, by penetrating between the particles of bodies, destroys their *cohesion,* or the natural force which keeps them united, and makes them pass from the solid to the liquid state. If, after having rendered them liquid, the heat be continued, the caloric, by separating the particles more and more, at last removes them to such a distance that they become invisible as air. The body is then said to have become gaseous (a vapour). By removing in any way the caloric, the body again becomes liquid; and by a further subtraction of that principle, it passes into its original state of a solid. *Disaggregation* is opposed to *aggregation,* which signifies a union or juxta-position of particles. *Aggregation* differs from *cohesion;* the former being the state of union of particles, the other the power which keeps them united. Some pharmacologists have wished to make *disaggregation* a particular operation, but this word expresses only a separation of the particles of a body, in whatever manner that is effected. Accordingly, such a separation may be obtained by *pulverization, fusion,* or *solution,* which are the real operations,—*disaggregation* is only their effect."

† *Liquefaction* is differently explained by others. With some it is synonymous with *aqueous fusion,* or the solution of salts in their waters of crystallization by increase of temperature, and by some to designate the fusion of bodies, such as butter, lard, and wax, which melt with a slight increase of heat.

‡ Some have two modes of fusion, one *igneous,* the other *aqueous.* In the former, the disaggregation of the body is effected by caloric alone; and in the latter, by increase of temperature, the water contained in the body becomes capable of keeping melted and dissolved among its particles, those of the body which previously kept the water solidified among its particles.

209. During fusion and vaporization, caloric is imparted to the body melted or vaporized; and as the temperature is not increased at the same time, the caloric is said to become *latent.* During condensation and evaporation, caloric is abstracted or evolved, and becomes *sensible.*

210. These changes take place at certain determinate degrees of temperature *, which are called the freezing or melting points, or boiling points, of each substance. Of these, tables are inserted in the Appendix.

211. In general, simple substances are less fusible than compounds; thus, the simple earths cannot be melted singly, but when mixed are easily fused. Metallic mixtures melt more readily than the simple metals, not only than the mean of the whole, but sometimes than the most fusible. On this depends the utility of solders.

212. The additions which are sometimes made to refractory substances to promote their fusion, are termed *fluxes.*

213. These fluxes are generally saline bodies.

a. The alkalies, potass, and soda, promote powerfully the fusion of siliceous stones; but they are only used for accurate experiments.

The *white flux* is a mixture of a little potass with carbonate of potass, and is prepared by deflagrating together equal parts of nitrate of potass and supertartrate of potass.

When an oxide is at the same time to be reduced, the *black* flux is to be preferred, which is produced by the deflagration of two parts of supertartrate of potass and one of nitrate of potass. It differs from the former only in containing a little charcoal.

Soap promotes fusion by being converted by the heat into carbonate of soda and charcoal.

b. Aluminous stones have their fusion greatly promoted by the addition of sub-borate of soda.

c. Muriate of soda, the mixed phosphate of soda and ammonia, and other salts, are also occasionally employed.

214. The vessels in which fusion is performed, must resist the heat necessary for the operation. In many pharmaceutical purposes, an open fire is sufficient; and an iron or copper ladle or pot may be used.

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* *Temperature* is that state of any body, by which it excites the sensation of heat or of cold, and produces the other effects which depend on the excess or deficiency of caloric.

215. In other cases, the heat of a furnace is required, and the fusion is performed in crucibles.

216. *Crucibles* are of various sizes, forms and materials.

217. The large crucibles are generally conical, with a small lip for the convenience of pouring out: the small ones are truncated triangular pyramids, and are commonly sold in nests.

218. The Hessian crucibles are composed of clay and sand, and when good will support an intense heat many hours, without softening or melting; but they are disposed to crack when suddenly heated or cooled. This inconvenience may be on many occasions avoided, by using a double crucible, and filling up the interstice with sand, or by covering the crucible with a lute of clay and sand, by which means the heat is transmitted more gradually and equally. Those which give a clear sound when struck, and are of an uniform thickness, and have a reddish-brown colour, without black spots, are reckoned the best.

219. Wedgwood's crucibles are made of clay mixed with baked clay finely pounded, and are in every respect superior to the Hessian, but they are expensive.

220. The black lead crucibles, formed of clay and plumbago, are very durable, resist sudden changes of temperature, and may be repeatedly used; but they are destroyed when saline substances are melted in them, and suffer combustion when exposed red-hot to a current of air.

221. When placed in a furnace, crucibles should never be set upon the bars of the grate, but always upon a support. Dr Kennedy found the hottest part of a furnace to be about an inch above the grate. They may be covered, to prevent the fuel or ashes from falling into them, with a lid of the same materials, or with another crucible inverted over them.

222. When the fusion is completed, the substance may be either permitted to cool in the crucible, or poured out upon a slab, or into a heated mould anointed with tallow, never with oil, or, what is still better, covered with a thin coating of chalk, which is applied by laying it over with a mixture of chalk diffused in water, and then evaporating the water completely by heat. To prevent the crucible from being broken by cooling too rapidly, it should be either replaced in the furnace, to cool gradually with it, or covered with some vessel, to prevent its being exposed immediately to the air.

223. Fusion is performed with the intentions,

a. Of weakening the attraction of aggregation,

1. To facilitate mechanical division, as in the granulation of tin or phosphorus;

2. To produce mechanical union, as in soldering;

3. To promote chemical action, as in forming plasters, alloys, running glazes, and combining sulphur with metals.

b. Of separating from each other substances of different degrees of fusibility, as metals from their scoriæ.

224. *Vaporization* *, in its most general sense, is the conversion of a solid or fluid into vapour by the agency of caloric, whether accompanied by decomposition or not.

225. Some solids, unless subjected to very great pressure, are at once converted into vapour, although most of them pass through the intermediate state of fluidity.

226. Vaporization is employed,

a. To separate substances differing in volatility.

b. To promote chemical action, by disaggregating them.

227. When employed with either of these views, either

a. No regard is paid to the substances volatilized,

1. From fluids, as in evaporization;
2. From solids, as in ustulation and charring;

b. Or the substances vaporized are condensed in proper vessels,

1. In a liquid form, as in distillation;
2. In a solid form, as in sublimation;

c. Or the substances disengaged are permanently elastic, and are collected in their gaseous form, in a pneumatic apparatus.

228. Vaporability is merely a relative term, and from analogy it may be concluded that all bodies may be converted into vapour at a very high temperature, and *vice versa*, that all gases may be condensed by very great abstraction of caloric.

229. Substances are however said to be permanently elastic, when they exist in the form of air at ordinary temperatures; to be vaporizable, when they can be converted into the form of an elastic fluid at an increased temperature; to be volatile, when a slight increase is sufficient for the purpose; and to be fixed, when it requires a great increase, or cannot be effected by any means we possess.

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* *Vaporization* is variously employed by different authors. Carbonell applies it indifferently to evaporation by heat, sublimation, distillation, and gazification. Morelot employs it for spontaneous evaporation. According to M. Henry, vaporization seems to imply the formation of visible vapours, which are afterwards dissipated in the air as useless, as in evaporation by heat. He also thinks it would have more value if employed to express the reduction of a liquid into vapour in close vessels, and then we should have *evaporation* in an open capsule, and *evaporization* in the boiler of a still.

230. *Vaporization* is much retarded by increase of pressure, and facilitated by its diminution, insomuch, that some substances which, under the ordinary pressure of the atmosphere, seem to pass at once from the state of solid to that of vapour, may, by the application of sufficient pressure, be made to assume the intermediate state of fluidity; while, on the contrary, all fluids which have been hitherto tried, begin in a vacuum to boil and to emit vapour, when their temperature is lower, by 120° at least, than their vaporific point, at the ordinary pressure of the atmosphere.

231. *Evaporation* is the conversion into steam and wasting of any liquid, whether it be pure or nearly so, or contain in solution any substance, as salts or vegetable matters. There is no formation of any new substance; and when the evaporated fluid contains any substance in solution, it is merely the solvent, or a part of it, that is removed, and the dissolved matter remains either solid or in concentrated solution.

232. *Spontaneous evaporation* is when, without the application of heat, it takes place quietly, with an imperceptible waste of the fluid evaporated. It is most commonly observed when a large surface is exposed to the action of the atmosphere; and it was formerly supposed to be a mere solution of vapour in the air. But that this is not the case, appears from spontaneous evaporation taking place more rapidly when air is not present, as under the exhausted receiver of an air pump. The acceleration of spontaneous evaporation by a current of air blowing over the surface of a fluid, is owing to the removal of the vapour lying on its surface, which, by its pressure, prevents its further formation *.

233. *Ebullition* is when, in consequence of the application of heat, evaporation is rapidly performed, with the formation of bubbles of vapour which pass through the fluid, and burst on its surface. Of some viscid fluids the bubbles do not burst rapidly, but accumulate and boil over the vessel; to prevent which, it is necessary sometimes to pour a little oil on the surface, or to break the bubbles by stirring. When vapour is rapidly formed at the bottom of the fluid before the whole has been heated to the boiling point, violent successions take place, in consequence of its rapid condensation,

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* The French translators have added the following note, in which the explanation is not very different: "The atmosphere undoubtedly retards evaporation in proportion to its pressure; but it promotes it remarkably by its space; for it is known that the quantity of vapour is always proportional to the temperature and surrounding space; therefore renewing the atmosphere at the surface of the liquid evaporating produces the same effect as if the space were increased. It forms a new vehicle for the reception of the vapour."

as it rises in the colder fluid. This is prevented by inserting a coil of metallic wire in the fluid, to be evaporated by ebullition.

234. It is performed in open, shallow, or hemispherical vessels of silver, tinned copper or iron, earthen-ware or glass. The necessary caloric may be furnished by means of an open fire, a lamp or a furnace, and applied either directly, or by the intervention of sand, water, or vapour. The degree of heat must be regulated by the nature of the substance operated on. In general, it should not be greater than what is absolutely necessary. It is promoted by reduction of atmospheric pressure, and removal of the steam as it is formed.

235. Evaporation may be,

a. Partial:
  1. From saline fluids, Concentration;
  2. From viscid fluids, Inspissation.

b. Total, Exsiccation.

236. *Concentration* * is employed,

a. To lessen the quantity of diluting fluid; as in sulphuric acid and saline fluids in general.

b. As a preliminary step to crystallization; as in the manufacture of sea salt.

237. *Inspissation* is almost confined to animal and vegetable substances; and as these are apt to be partially decomposed by heat, or to become empyreumatic, the process should always be performed, especially towards the end, in a water or vapour bath.

238. *Exsiccation* is the total expulsion of moisture from any body by means of caloric. The exsiccation of compound oxides should always be performed in the water bath.

239. Exsiccation may be also performed without increased temperature, by confining the substance to be dried under a vessel, or, what is more powerful, under an exhausted receiver, along with a substance having a strong affinity for water, as sulphuric acid, lime, &c.

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* Concentration is, according to M. Henry, the reduction into a smaller volume of the particles of a body diffused in a liquid. It differs from evaporation in this, that evaporation has a reference more to the liquid which is dissipated, and concentration more to the body dissolved in the liquid which remains. Further, concentration implies a partial evaporation and a liquid product; for if the evaporation were complete, it would then be said to be to dryness, or that the body was dried. Lastly, concentration may be the result of an operation different from evaporation. It is sufficient that a part of the vehicle be removed. Thus vinegar is concentrated by partly congealing it. The part frozen is water, and the remaining liquid is more acid than before.

240. Exsiccation is performed on saline bodies, to render them more acrid or pulverulent, or to prepare them for chemical operations. Animal and vegetable substances are exsiccated to give them a solid form, and to prevent their fermentation.

241. Salts are deprived of their water of crystallization by exposing them to the action of heat in a glass vessel or iron ladle. Sometimes they first dissolve in their water of crystallization (or undergo what is called the *watery fusion)*, and are afterwards converted into a dry mass by its total expulsion; as in the calcination of borax, or burning, so called, of alum.

242. The sudden exsiccation of some salts, as muriate of soda, is attended with a crackling noise, and splitting of the salt, which is termed *decrepitation*, and is performed by throwing into a heated iron vessel, small quantities of the salt at a time, covering it up, and waiting until the decrepitation be over, before a fresh quantity is thrown in.

243. *Ustulation* is almost entirely a metallurgic operation, and is employed to expel the sulphur and arsenic contained in some metallic ores. The reverberatory furnace is commonly employed for roasting, and the heat is at first very gentle, and slowly raised to redness. The process is accelerated by exposing as large a surface of the substance to be roasted as possible, and by stirring it frequently, so as to prevent any agglutination, and to bring every part in succession to the surface. It is performed on small quantities in tests placed within a muffle. Tests are shallow vessels made of bone ashes, or baked clay. Muffles are vessels of baked clay, of a semi-cylindrical form, the flat side forming the floor, and the arched portion the roof and sides. The end and sides are perforated with holes for the free transmission of the heated air, and the open extremity is placed at the door of the furnace, for the inspection and manipulation of the process.

244. *Charring* * may be performed on any of the compound

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* *Torrefaction* is that operation in which certain dry bodies are exposed to the action of a moderate fire, so as to volatilize some, and modify other principles in it. Thus, rhubarb is torrefied, or toasted, to alter the purgative, and to preserve the astringent principle. Oily seeds are torrefied to dry up the mucilage, which then makes less resistance to the separation of the oil.

Torrefaction is performed in two ways. In one, the substance is put into a shallow vessel over the fire, and stirred continually with a spathula; in the other, it is put into a cylinder of iron, which is turned upon an axis over a fire of wood or charcoal, as in the roasting of coffee. This instrument is commonly, but improperly, called a *burner*.

oxides, animal or vegetable, by subjecting them to a degree of heat sufficient to expel all their hydrogen, nitrogen, and oxygen, while the carbon, being a fixed principle, partly remains behind in the state of charcoal. The temperature above 212 necessary for the operation, may be produced either by the combustion of other substances, or by the partial combustion of the substance to be charred. In the former case, the operation may be performed in any vessel which excludes the air while it permits the escape of the gases or vapours formed. In the latter, the access of air must be regulated in such a manner, that it may be suppressed whenever the combustion has reached the requisite degree; for if continued to be admitted, the charcoal itself would be dissipated in the form of carbonic acid gas, and nothing would remain but the alkaline and earthy matter, which these substances always contain. When combustion is carried this length, the process is termed *Incineration*. The vapours which arise in the operation of charring are sometimes condensed, as in the manufacture of tar. Charcoal is sometimes obtained as a bye product in other processes, as in the distillation of tar and pyrolignic acid.

245. *Condensation* is the reverse of expansion, and is produced either,

a. Gradually, by mechanical pressure forcing out the caloric in a sensible form, as water is squeezed out of a sponge; or,

b. Suddenly, by the chemical abstraction of caloric, which is followed by an approximation of the particles of the substance.

246. Gradual condensation is rarely attended by any change in the form of aggregation, but generally consists in a mere diminution of volume or in contraction.

247. It may, however, be performed so rapidly, as to be attended with an obvious disengagement of heat and light; as in the inflammation of tinder in the compressing syringe.

248. Many of the gases hitherto considered as permanently elastic have also been condensed into a fluid form by Mr Faraday, by the compression excited by their own vapour greatly expanded by heat.

249. Compression is used occasionally to promote chemical action, and to favour the union of gaseous bodies with each other or with fluids; as when we compress carbonic acid into water or alkaline solutions.

250. Sudden condensation only occurs when substances naturally liquid or solid have been converted into the state

of vapour, by heat, reduction of pressure, or other adventitious circumstances, and takes place whenever these circumstances are removed. It is therefore always preceded by vaporization, and comprehends those operations in which the substances vaporised are condensed in proper vessels. When the product is a fluid, it is termed distillation; when solid, sublimation.

251. *Distillation* is said to be performed,

- *a. Via humida*, when a fluid is subjected to the operation;
- *b. Via sicca*, when solids are subjected to the operation, and the fluid product arises from decomposition, and a new arrangement of the constituent elements.

252. The distinction seems sufficiently obvious; yet there are cases of which it is doubtful to which of them they belong. *Via humida* we distil water, aromatic waters, volatile oils, spirits, ethers, *aqua ammoniæ* by the old process, ammoniated spirits, distilled vinegar. *Via sicca* we distil empyreumatic oils, spirit of hartshorn, pyrolignic acid, mineral acids, chlorine.

253. The objects of distillation are,

- *a.* To separate more volatile fluids from less volatile fluids or solids; as spirit from water, ether from spirit, volatile oil from vegetables.
- *b.* To promote the union of different substances; as water or spirit with volatile oils.
- *c.* To generate new products by the action of fire; formation of ether, all distillations *via sicca*.

254. In all distillations the heat applied should not be greater than what is necessary for the formation of the vapour, and even to this degree it should be gradually raised. The vessels also in which the distillation is performed should never be filled above one-half, and sometimes not above one-fourth, lest the substance contained in them should boil over.

255. In distillation we have to consider

- *a.* The apparatus;
- *b.* The management of the heat.

256. As distillation is a combination of evaporation and condensation, the apparatus consists of two principal parts;

- *a.* The vessels in which the vapours are formed;
- *b.* The vessels in which they are condensed.

257. The vessels employed for both purposes are variously shaped, according to the manner in which the operation is conducted. The first difference depends on the direction of the vapour after its formation. It either

a. Descends; distillation *per descensum;*
b. Ascends; distillation *per ascensum;*
c. Or passes off by the side; distillation *ad latus* *.

258. Distillation *per descensum* is obsolete as a pharmaceutic process, but is used in the arts when the vapour is very heavy and cannot be made to ascend. The matter to be distilled is supported over the condensing chamber or vessel, and the heat is applied around and above the matter to be distilled. In this way volatile metals, as mercury and zinc, are distilled from their ores. Organic substances are also treated in this way; but the product is of a mixed nature, as in the manufacture of tar, which is a mixture of empyreumatic oil and pyrolignic acid, distilled products, with melted rosin.

259. On a small scale, a perforated plate, generally of tinned iron, is fixed within any convenient vessel, so as to leave a space beneath it. The subject of the operation is laid on this plate, and is covered by another, accurately fitting the vessel, and sufficiently strong to support the fuel which is burnt upon it. Thus the heat is applied from above, and the vapour is forced to descend into the inferior cavity, where it is condensed. In this way the oil of cloves is said to have been prepared. But it is evident that the application of the heat was very uneconomical.

260. Distillation *per ascensum* and *ad latus* are but modifications of each other. In the former, the vapour is made to ascend into an upper vessel, and is there condensed. In the latter, the vapour, after ascending a little way, is carried off laterally before it is condensed. But in the distillation *per ascensum*, there is always a lateral condensing apparatus, as the whole vapour can scarcely be condensed in the upper vessel.

261. The simplest example of distillation *per ascensum* is where the cucurbit and capital are used, or the apparatus called the cold still, the Mohrenkopfe of the Germans.

262. The vessel most commonly employed for the distillation of waters and spirits is the common copper-still, which consists of a body for containing the materials, and a head into which the vapour ascends. From the middle of the head a tube rises a short way, and is then reflected downwards, through which the steam passes to be condensed.

263. Another kind of head, rising to a great height before it is reflected, is sometimes used for separating fluids,

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* The French annotators do not admit of these three modes of distillation, and say that there are only two, as performed in the alembic or in the retort. I have, however, retained the former classification, as it still appears to me to be well founded.

which differ little in volatility, as it was supposed that the less volatile vapours would be condensed, and fall back into the still, while only the more volatile vapours would arise to the top, so as to pass to the refrigeratory. The same object may be more conveniently and economically attained by managing the fire with caution and address.

264. The greater the surface exposed, and the less the height the vapours have to ascend, the more rapidly does the distillation proceed; and so well are these principles understood by the Scotch distillers, that they do not take more than three minutes to discharge a still containing 50 gallons of fluid.

265. The condensing apparatus used with the common still is very simple. The tube in which the head terminates is inserted into the upper end of a pipe, which is kept cool by passing through a vessel filled with water, called the Refrigeratory. This pipe is commonly made of a serpentine form; but as this renders it difficult to be cleaned, Dr Black recommends a sigmoid pipe. The refrigeratory may be furnished with a stop-cock, that when the water it contains becomes too hot, and does not condense all the vapour produced, it may be changed for cold water.

266. A very convenient condensing apparatus, now much used, is a long straight pipe, which is surrounded by another tube considerably wider, which acts as a Refrigeratory. A stream of water is made to pass through the intervening space, entering cold at the remote or lower end, and issuing heated at the upper or near end. In all cases, the product of the distillation drops from the lower end of the pipe into the vessel destined to receive it; and we may observe, that when any vapour issues along with it, the condensation is insufficient, and we should either diminish the power of the fire, or change the water in the refrigeratory.

267. *Circulation* was a process formerly in use. It is a distillation *per ascensum*, and consisted in arranging the apparatus so, that the vapours were no sooner condensed into a fluid form, than this fluid returned back into the distilling vessels, to be again vaporized; and was effected by distilling in a glass vessel, with so long a neck that the vapours were condensed before they escaped at the upper extremity, or by inverting one matrass within another. During the formation of the red oxide of mercury, the quicksilver circulates in the vessel.

268. The distillation *ad latus* is performed in a retort, or pear-shaped vessel, having the neck bent to one side. The body of a good retort is well rounded, uniform in its appear-

ance, with a thin bottom, and of an equal thickness, and the neck is sufficiently bent to allow the vapours, when condensed, to run freely away, but not so much as to render the application of the receiver inconvenient, or to bring it too near the furnace. The passage from the body to the neck must be perfectly free and sufficiently wide, otherwise the vapours produced in the retort circulate long in its body, without passing over into the receiver.

269. The condensing apparatus used with the retort is commonly a receiver. These are of many shapes,

- *a.* Simple, which may be either a ballon or a bottle;
- *b.* Tubulated, having a tubulature, which may be either closed with a stopper, or connected with other apparatus by a bent tube;
- *c.* Spout, having a spout issuing from the lower side, by which means the product of different periods of the process may be kept separate.
- *d.* Compound, consisting of a series of receivers, as the aludels of the old chemists, or those used now in the distillation of nitric and muriatic acid; or of a series of bottles, connected by tubes, as in Woulfe's apparatus.

270. *Connection and adjustment of parts.*—In the common still, the tube of the head is fitted into the condensing tube, or screwed to it by a joining screw, and it is rare that any lute is necessary. As the remote orifice is left open, all the joinings may be air tight.

271. When a simple retort and receiver are used, the neck of the retort should reach into the body of the receiver. A lute will be necessary to close the juncture, even if their necks be adapted by grinding.

272. A double conical tube of glass or earthen-ware, called an Adopter, is always advantageously interposed between the retort and receiver, receiving the neck of the former, and entering into the body of the latter. The joining of the adopter and receiver must be accurately luted; that between the retort and adopter may be left without lute, as it soon gets closed by a little condensed vapour, and it acts as a safety valve, only giving way when the internal pressure would endanger the bursting of the apparatus.

273. It is never advisable to have a retort and receiver made perfectly air-tight; because, the air in the vessel by its expansion when heated, causes great pressure on the surface of the distilling fluid, and thus retards the process. There is also much danger either of the lute giving way, or the vessels themselves bursting from the expansion of the

contained air. If permanently elastic fluids be extricated during the process, one of these consequences is inevitable. In such cases it is necessary to provide a way by which these gases may escape.

274. The materials to be operated upon are, in many instances, put into the body of the still, or introduced into the body of the retort before the condensing apparatus is connected with it; in other instances, not until after the connection is made.

275. In the former case, there is no difficulty with the common still pot; but with the simple retort, a funnel, with a long tube, either straight or bent at right angles, called a Retort funnel, is necessary, to prevent the neck of the retort from being soiled by the fluid to be poured in.

276. When the apparatus is previously mounted, fluids may be poured into the body of the still by a funnel-mouthed tube reaching nearly to the bottom, through which fluid may be poured in, but vapour cannot escape. The same end is obtained in retorts by a long-tubed funnel introduced through a cork fitted into the tubulature, by which contrivance I have prepared large quantities of nitric ether with perfect ease and safety; or a funnel with a double bent tube (Welter's tube of safety) may be adapted to the tubulature.

277. From the common still the residuum of the process may be drawn off by a stop-cock, without dismounting the apparatus; from a retort it can only be done by a syphon or long-tubed syringe.

278. The body of the still or retort should never be filled above one-half, sometimes not above one-fourth, to prevent the possibility of boiling or spirting over.

279. The modes of applying heat have been already noticed under evaporation, but its management varies according to the nature of the process.

280. When the liquid to be distilled over already exists in the material distilled, and especially when it is to be dissolved out of a solid by the action of a volatile menstruum, as in the distilled waters and spirits, the heat should be gradually raised, that the action may be complete, and that no volatile matter be forced over unimpregnated.

281. When, however, a volatile fluid is to have its nature changed by the chemical action of another substance, as in the formation of ether, the heat must be raised quickly, as otherwise part of the spirit will rise unchanged, not etherified.

282. Means must also be used to prevent the receiver from being heated by the caloric evolved during the con-

densation of the vapours. It may either be immersed in cold water, or covered with snow or pounded ice; or a constant evaporation may be supported from its surface, by covering it with a cloth, kept moist by means of the trickling of water, from a vessel placed above it, through minute syphons or spongy worsted threads. But as, during the process of distillation, permanently elastic fluids are often produced, which would endanger the breaking of the vessels, these are permitted to escape, either through a tubulature, or hole in the side of the receiver, or through a hole made in the luting.

283. In most apparatuses for distillation, considerable waste of heat and time is sustained by a portion of the vapour being condensed in the upper part of the still or retort, and running back into its body, to be distilled over and over again. Therefore this part of the apparatus should never be cooled, as is often done, but kept hot, that as little vapour as possible be condensed, until it reaches the condenser.

284. During the condensation of vapour, there is necessarily a great deal of heat communicated to surrounding bodies, first to the vessel, and from it to substances in contact with it. This heat may be economically used,

1. To heat water, in which the condenser is commonly immersed.
2. To heat the next charge of the still.
3. To distil at the same time another more volatile fluid.
4. To distil the same fluid under diminished pressure.

285. Distillation is greatly facilitated, and performed at a much reduced temperature, by removing or counteracting causes impeding the formation of vapour. These are,

a. The pressure of the atmosphere.
b. The pressure of the vapour already formed.

286. The pressure of the vapour is removed by condensing it as quickly and as completely as possible.

287. Many contrivances have been used for taking off the pressure of the atmosphere on distilling *in vacuo*. The air of the apparatuses may be removed, either by means of an exhausting syringe, or by filling the whole apparatus with steam, and thus to expel the air.

288. The pressure of the atmosphere is then kept off, either,

a. By stop-cocks, or
b. The barometric mercurial valve.

289. The former method has been used by Mr Tennant, Mr Tritton and Mr Barry; the latter first by myself. It consists in connecting with the condenser a tube thirty inches long, the lower end of which dips into a shallow dish, containing a sufficient quantity of mercury to fill it. The boiler is then heated until the whole air be expelled through the tube, and vapour begins to escape; and upon condensing the vapour in the condenser, the mercury rises in the tube, effectually precluding the pressure of the atmosphere; and the distillation may now be completed at a greatly reduced temperature.

290. Some inconveniences occasionally occur in distillation, which it is necessary to guard against.

291. Boiling or spirting over is prevented by means of a little soap or oil on the surface of the fluid, or by breaking and bursting the bubbles by an agitator, as in the large whisky stills.

292. Burning is prevented by regulating the heat, by suspending the solid subject of the distillation in a basket exposed to the action of the vapour in the head of the still, and by mechanical contrivances for scraping the bottom of the still.

293. The bursting of the apparatus is guarded against by valves and safety tubes.

294. The variety of forms given to Woulfe's apparatus is now very great. It essentially consists of a tubulated retort, adapted to a tubulated receiver. With the tubulature of the receiver a three-necked bottle is connected by means of a bent tube, the further extremity of which is immersed, one or more inches, in some fluid contained in the bottle. A series of two or three similar bottles are connected with this first bottle in the same way. In the middle tubulature of each bottle, a glass tube is fixed, having its lower extremity immersed about a quarter of an inch in the fluid. The height of the tube above the surface of the fluid must be greater than the sum of the columns of fluid standing over the farther extremities of the connecting tubes, in all the bottles or vessels more remote from the retort. Tubes so adjusted are termed Tubes of safety, for they prevent that reflux of fluid from the more remote into the nearer bottles, and into the receiver itself, which would otherwise inevitably happen, on any condensation of vapour taking place in the retort, receiver, or nearer bottles. The further tubulature of the last bottle is commonly connected with a pneumatic apparatus, by means of a bent tube. When the whole is properly adjusted, air blown into the retort should pass

through the receiver, rise in bubbles through the fluids contained in each of the bottles, and at last escape by the bent tube. In the receiver, those products of distillation are collected, which are condensable by cold alone. The first bottle is commonly filled with water, and the others with alkaline solutions, or other active fluids; and as the permanently elastic fluids produced are successively subjected to the action of all these, only those gases will escape by the bent tube which are not absorbable by any of them.

295. *Cohobation* is when a fluid, already distilled from any substance, is redistilled from a fresh quantity of the same substance, to impregnate it more strongly with its virtues; as in double-distilled lavender water.

296. *Dephlegmation* is when, by means of distillation, we render a more volatile fluid stronger, and leave a portion of the water undistilled; as in rectifying spirituous liquors *.

297. *Rectification* is the repeated distillation of any fluid, already distilled, to refine it and separate it more completely from foreign impregnations. Commonly in the second distillation some substances are added, which retain or destroy these impregnations; and it is likewise performed more carefully, and with a lower temperature.

298. Rectification is sometimes performed in a single process, without dismounting the apparatus, by redistilling the product into a second receiver from the first, into which the material to assist the rectification has been previously put. It is only necessary to discontinue the application of cold, by which the condensation of the product has been effected in the first receiver, and to substitute the application of a sufficient degree of heat, to drive it over into the second. There are many examples of rectification in the Pharmacopœia; spirits, ether, acids, volatile and empyreumatic oils, ammonia.

299. *Sublimation* differs from distillation only in the form of the product. When it is compact, it is termed a *Sublimate*; when loose and spongy, it formerly had the improper appellation of *Flowers*. The heat, if the open fire be not used, is most commonly applied through the medium of a sand-bath; and the degree of heat, and the depth to which the vessel is inserted in the bath, are regulated by the nature of the sublimate.

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* The French use *dephlegmation* in a different sense. It differs from *rectification* in furnishing two products; 1. The liquid remaining undistilled, the principal product; 2. The distilled liquid, or *phlegm*, less active, but still used.

300. Sublimation is performed,

a. To purify a volatile solid, as sulphur, benzoic acid, carbonate of ammonia, calomel, camphor.

b. To procure new combinations, as carbonate of ammonia, muriate of ammonia, muriate of ammonia and iron, calomel, corrosive sublimate, cinnabar.

301. The vessels employed for subliming are crucibles, cucurbits, jars, matrasses with wide necks, or retorts with short and wide necks; and the condensing vessels are a capital, a second jar, crucible, or the upper half of the matrass, or a second matrass inverted over the first. Sometimes a paper cone will suffice.

302. When there is a narrow orifice between the subliming and condensing vessel, it is in danger of being choked, which is best prevented by introducing a heated wire; in opaque vessels, the process is known to be finished when the capital ceases to be very hot.

303. The great importance of the elastic fluids in modern chemistry has rendered an acquaintance with the means of collecting and preserving them indispensable.

304. When a gas is produced by any means *, it may be received either,

a. Into vessels absolutely empty; or

b. Into vessels filled with some fluid, on which it exerts no action.

305. The first mode of collecting gases may be practised by means of a bladder, moistened sufficiently to make it perfectly pliable, and then compressed so as to empty it entirely. In this state it may be easily filled with any gas. An oiled silk-bag will answer the same purpose, and is more convenient in some respects, as it may be made of any size or form.

306. Glass or metallic vessels, such as balloons, may also be emptied for the purpose of receiving gases, by fitting them with a stop-cock, and exhausting the air from them by means of an air-pump.

307. But the second mode of collecting gases is the most convenient and common.

308. The vessels may be filled previously with a fluid, either,

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* MM. Henry and Guibourt have considered *gazification* as a peculiar process, in which, by the reaction among the principles of one or more bodies in close vessels, volatile products are obtained, which are collected in jars in the state of gas. Gazification takes place in different manners, according as it is necessary or not necessary to apply heat.

a. Lighter; or

b. Heavier than the gas to be received into it.

309. The former method is seldom employed; but if we conduct a stream of any gas heavier than atmospheric air, such as carbonic acid gas, muriatic acid gas, &c. to the bottom of any tall vessel, it will gradually displace the air, and fill the vessel.

310. On the contrary, a gas lighter than the atmospheric air, such as hydrogen, may be collected in an inverted vessel, by conducting a stream of it to the top.

311. But gases are most commonly collected by conducting the stream of gas into an inverted glass jar, or any other vessel filled with water or mercury. The gas ascends to the upper part of the vessel, and displaces the fluid. In this way gas may be kept a very long time, provided a small quantity of the fluid be left in the vessel, which prevents both the escape of the gas, and the admission of atmospheric air. Large quantities of gas are kept in various apparatus constructed for the purpose called Gas-holders, or, when furnished with the means of measuring the quantity, Gasometers.

312. The vessels for containing gases may be of various shapes; but the most commonly employed are cylindrical. They may be either open only at one extremity, or furnished at the other with a stop-cock, or ground glass stopper.

313. The manner of filling these vessels is to immerse them completely in the fluid, with the open extremity directed a little upwards, so that the whole air may escape from them, and then inverting them with their mouths downwards. When fitted with ground glass stoppers, they have merely to be immersed in water, with the aperture upwards and open to allow the air to escape; and when filled, the stopper is to be inserted before they are lifted out of the trough.

314. For filling them with convenience, a trough or cistern is commonly used. This either should be hollowed out of a solid block of wood or marble; or it may be constructed of wood, which should be well painted, or lined with lead, or tinned copper; or it may be made of tin-plate well painted or japanned. Its size may vary very much; but it should contain a sufficient depth of fluid to cover the largest transverse diameter of the vessels to be filled in it. At one end or side, there should be a shelf for holding the vessels after they are filled. This shelf should be placed about an inch or half an inch below the surface of the fluid. It may be fixed or moveable, and should be perforated with several holes, forming the apices of corresponding conical excava-

tions on the lower side, through which, as through inverted funnels, gaseous fluids may be more easily introduced into the vessels placed over them. In general, the vessels used with a mercurial apparatus should be stronger and smaller than those for a water-cistern.

315. We should also have a variety of glass and elastic tubes for conveying the gases from the vessels in which they are formed to the funnels under the shelf. Shallow trays are also useful when we wish to transfer the jars from the trough.

316. *Congelation* is the reduction of a fluid into a solid form, in consequence of the abstraction of caloric. The means employed for abstracting caloric are,

- *a.* The contact of cold bodies, which abstract a proportion of the heat;
- *b.* The evaporation of volatile fluids. The evaporation of some fluids is so rapid, that the remaining portion is frozen. This may be assisted by removing the pressure of the atmosphere, as in the Cryophorus, and in Professor Leslie's process for freezing;
- *c.* The liquefaction of solids, during which the caloric necessary to effect it becomes latent;
- *d.* The solution of saline bodies. In this process also heat becomes latent, and it is the most powerful means of producing cold which we possess.

317. Congelation is much used in chemical experiments; and cooling, so essential in many pharmaceutic processes, depends upon the same principles.

318. *Coagulation* is the conversion of a fluid into a solid of greater or less consistence, merely in consequence of a new arrangement of its particles, as during the process there is no separation of caloric or of any other substance. The means of producing coagulation are, increase of temperature, and the addition of certain substances, as alcohol, acids and runnets.

319. Coagulation is a property almost peculiar to animal substances, and especially to fibrine and albumen; and the solidification of these substances is permanent. They cannot be rendered again fluid without decomposition.

320. Coagulation is used in pharmacy for clarification.

321. *Gelatinization* is the concretion of a fluid into a soft solid, which may be again liquefied by a change of temperature.

- *a.* Most of these substances jelly on being cooled, and melt when heated, as solutions of gelatine, starch, pectic acid, (vegetable jelly,) soap.

b. I have found a principle in Mudar, which jellies on being heated, and melts on a reduction of temperature.

322. The processes of pharmacy may be arranged into those of combination, and those of decomposition *.

COMBINATION.

323. Bodies are either simple or compound.

324. A simple substance is a mass of elementary particles, and, therefore, these are all necessarily homogeneous.

325. A compound substance contains heterogeneous particles, or is composed of more elements than one.

326. Compound bodies may be divided into

a. Primary compounds, consisting of simple substances combined with each other. These may be subdivided into binary, ternary, quaternary, &c. according to the number of their constituents.

b. Secondary compounds, consisting of compound bodies combined with simple bodies, or with each other.

327. This division is convenient, but arbitrary, as we are in fact ignorant of what are really simple bodies, and cannot ascertain the manner of combination in bodies compounded of three or more elements.

328. The most minute particles into which any substance can be divided, similar to each other, and to the substance of which they are portions, are termed its *Integrant particles.*

329. The integrant particles,

a. Of simple substances are also their elementary particles;

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* The classification of the processes of pharmacy into those of combination and decomposition is convenient, but not correct, as chemical combination rarely occurs without some degree of decomposition. Buchner assumes two degrees of combination and decomposition. If quicklime be dissolved in water, the solution is transparent, and they cannot be separated by mechanical means; but the specific properties of the water and the lime are not altered; the lime is still caustic, and the water transparent, fluid, and vaporizable. This he calls a combination of the first degree. But if quicklime be dissolved in vinegar in certain proportions, the peculiar properties of each disappear, the lime is no longer caustic, nor the vinegar acid, and a new substance, a neutral salt, is produced. This is a combination of the second degree, which might also be called *Union*, as they have become one substance. In like manner, there are two degrees of decomposition. If we expose a solution of lime in vinegar to heat, the water is expelled, and a dry salt remains, both the water and salt retaining their peculiar properties. This is an instance of separation of the first degree. But if sulphuric acid be poured upon this salt, the acetic acid will be evolved, having properties quite different from those it possessed in the salt. This is a decomposition of the second degree.

- *b.* Of primary compounds are composed of elementary particles;
- *c.* Of secondary compounds are composed of intermediate particles.

330. Chemical combination is the intimate union of heterogeneous particles. It results from the exertion of the attraction of affinity, and is therefore subjected to all the laws of affinity.

331. Affinity is one of the species of attraction, and is regulated by the following laws:

- *a.* It does not act at sensible distances.
- *b.* It is exerted only between particles of different species.
- *c.* It is exerted by different bodies, with different degrees of force; and hence it was called *Elective Attraction.*
- *d.* It unites bodies in definite proportions; and when bodies combine in more proportions than one, these are multiples of each other.
- *e.* It unites a first proportion of one body with another, more strongly than a second; a second than a third, and so on; and hence it is in the inverse ratio of saturation *.
- *f.* It is influenced by cohesion, specific gravity, elasticity and temperature.
- *g.* It is often accompanied by a change of temperature.
- *h.* Substances chemically combined acquire new properties †.
- *i.* Substances chemically combined cannot be separated by mechanical means.
- *k.* The action produced by different affinities, existing in one substance, is called the *Resulting affinity.*

332. The neutralizing power of all bodies has a certain determinate proportion, to discover which the efforts of modern chemists is directed. Upon this principle the doctrine of chemical equivalents is founded, of which tables have been constructed, supposed to represent also the ratio of the weights of their integrant particles or their atomic weights. Some chemists have assumed as unity Hydrogen, as having the least atomic weight among material substances, and others Oxygen, on account of the importance of its agency in che-

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* When a body refuses to combine with an additional proportion of another body, it is said to be *saturated* with it.

† When they reciprocally suspend their original properties, they are said to *neutralize* each other.

mical operations. Dr Wollaston invented a logometric sliding scale, which is of great practical use.

333. Affinity is

- a. *Simple*, when two bodies unite, in consequence of their mutual attraction, whether these bodies be themselves simple, as oxygen and hydrogen, or compound, as sulphuric acid and potash, and even although, in the latter case, it be attended with decomposition, as when sulphuric acid unites with the potash of salt of tartar;
- b. *Compound*, when there is more than one new combination, and when the new arrangement would not have taken place, in consequence of the attractions tending to produce either combination singly, as when solutions of muriate of lime and carbonate of ammonia decompose each other mutually;
- c. *Disposing*, when bodies unite not merely in consequence of the affinity they possess for each other, but of the affinity which the compound they are about to form has for another substance present, with which it immediately combines; thus iodine added to a solution of potash decomposes the water to form iodic and hydriodic acids.

334. The attractions which tend to preserve the original arrangement of bodies presented to each other are denominated *Quiescent attractions;* those which tend to destroy the original, and to form a new arrangement, are termed *Divellent attractions.*

335. It is evident that no new arrangement can take place, unless the divellent be more powerful than the quiescent attractions.

336. To produce the chemical union of any bodies, it is necessary,

1. That they possess affinity for each other;
2. That their particles be placed into actual contact;
3. That the strength of the affinity be greater than any counteracting causes which may be present.

337. The principal counteracting causes of chemical union are,

1. The attraction of aggregation; *cohesion;*
2. Gaseous repulsion of particles;
3. Affinities for other substances.

338. The attraction of aggregation is overcome by means of

1. Mechanical division.
2. The action of caloric.

339. The gaseous repulsion of particles is prevented from operating, by presenting the bodies to each other, before they have assumed the form of gas, or, as it is called, in their nascent state, or by flame, the electric spark or sudden compression, which probably operate by forcing the particles within the sphere of attraction.

340. The means to be employed for overcoming the action of other affinities will be treated of under Decomposition.

341. Combination is facilitated by increasing the points of actual contact, or by rendering them closer,

1. By mechanical agitation;
2. By condensation; compression.

342. The processes employed for producing combination may be considered,

1. With regard to the nature of the substances combined; and,
2. To the nature of the compound produced.

343. There are many instances of bodies of all forms of aggregation entering into chemical union with other bodies of the same form, or of different forms, and producing compounds of various forms of aggregation.

344. The combination of gases with each other, in some instances, takes place when simply mixed together; thus nitrous and oxygen gases combine as soon as they come into contact; in other instances, it is necessary to elevate their temperature to a degree sufficient for their inflammation, either by means of the electric spark, or the contact of an ignited body, as in the combination of oxygen gas with hydrogen gas, or by an equivalent degree of pressure.

345. When gases combine with each other, there is generally a considerable diminution of bulk, and not unfrequently they are condensed into a liquid or solid form. But when the combination is effected by ignition, a violent expansion previously takes place, in consequence of the increase of temperature.

346. When gases combine with gases, the resulting compound is either,

- *a.* Gaseous; as nitrous oxide, ammonia and muriatic acid;
- *b.* Liquid; as water;
- *c.* Solid; as carbonate and muriate of ammonia.

347. When gases retain the gaseous form after their combination with each other, they either,

- *a.* Retain their aggregate volume; as in atmospheric air, nitrous gas and muriatic acid;

b. Or are condensed to one-half; as in the formation of ammonia;

c. Or to one-third; as in nitrous acid gas.

348. Gases dissolve liquids, or seem to dissolve them, as in all cases of spontaneous evaporation. The volume of the gas is not altered in consequence of such solution.

349. Gases dissolve solids, and in consequence of the combination, undergo either

a. Expansion. The expansion is a multiple of the original volume; as carbonic oxide; which is twice the volume of the oxygen it contains;

b. No change; as carbonic acid, sulphuretted hydrogen gas;

c. Condensation. The condensation is a multiple of the original volume, as bihydroguret of phosphorus, which is half the volume of the hydrogen.

350. Gases are absorbed by fluids, which either

a. Remain fluid after saturation, as water saturated with ammonia, muriatic acid, carbonic acid, &c.

b. Or become solid, as mercury, various melted metals, by the absorption of oxygen.

c. Or dissolved substances are precipitated by the absorption of gas, as carbonate of lime is precipitated from lime-water.

351. The maximum volume of each gas absorbable by any fluid is always determinate; but the proportion increases with the lowness of temperature and the degree of pressure. The volume of the liquid is always increased by the absorption, as in the saturation of water with ammonia or muriatic acid.

352. Fluids,

1. Are dissolved in gases;
2. Or absorb them;
3. Combine with fluids;
4. Dissolve solids;
5. Or are rendered solid by them.

353. The proofs of the combination of fluids are,

1. Their apparently perfect union; as evinced by their remaining transparent; their not separating according to their specific gravity, and their not being separable by mechanical means; as when dilute alcohol or acid is added to water.
2. Condensation, and evolution of heat, as in strong sulphuric acid or alcohol with water.
3. Change of properties, as the union of alkaline with acid solutions.

4. Change of form of aggregation, either precipitation, as from sulphuric acid with lime-water; or effervescence, as from solution of a carbonated alkali with an acid.

354. Solids,

1. Are dissolved in gases, when they either do not alter their volume, but increase their specific gravity, or alter their volume always in a multiple ratio.
2. Absorb gas.
3. Are dissolved in fluids—*Solution.*
4. Solidify fluids; as in the slaking of lime and the setting of plaster of Paris.
5. Act upon solids; rarely, unless promoted by mechanical means, as friction or percussion; or by heat.

355. *Solution* * is the diminution of aggregation in any solid or fluid substance, in consequence of its entering into chemical combination. The substance, whether solid, as sugar, or fluid, as volatile oil, whose aggregation is lessened, is termed the *Solvend;* and the substance, by whose agency the solution is effected, is often called the *Menstruum* or *Solvent,* as water or alcohol.

356. Solution is said to be performed *via humida,* when the natural form of the solvent is fluid; but when the agency of heat is necessary to give the solvent its fluid form, the solution is said to be performed *via sicca.*

357. Many of the pharmaceutical preparations are instances of solution in various menstrua. They are attended either,

a. With no change of property.

Water affords syrups, mucilages, emulsions, saline solutions.
Alcohol, tinctures, spirits, elixirs, liqueurs.
Ether, medicated ethers: dissolves caoutchouc.
Acetic acid, medicated vinegars.

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* The French annotators following Carbonell say, that according to the present doctrine, solution should be considered as a mechanical *(disaggregation),* not a chemical action. But MM. Henry and Guibourt define solution to take place, when, by the action of a reciprocal affinity between a liquid and a solid, the latter, without any change in its chemical properties, is so divided in the former, that its transparency is not disturbed.

Solution, lotion, and lixiviation, according to the same pharmaceutists, have very great analogy, but differ in the following respects. In *solution,* it is the useful body which dissolves in the water, and disappears entirely, or almost entirely. In *lixiviation,* it is also the useful body which dissolves in the water; but the residuum is abundant, and renders necessary the reiterated affusion of the solvent, which constitutes the true action of lixiviating *(lessiver).* In *lotion,* the useful body is insoluble, and the matters dissolved are rejected. Bodies in this process are washed until the water dissolves nothing more.

Volatile oil dissolves resins.
Fixed oil dissolves resins, fats, and oxide of lead.
Mercury forms amalgams by dissolving other metals.

b. With change of property.

Acid liquors dissolve dry alkalies, earths, and metalic oxides.
Alkaline liquors dissolve solid acids, resins, solid fats, animal substances.

358. Solutions *via sicca* are rare in pharmacy. The solvents are,

Sulphur.
Phosphorus.
Metals.

359. The dissolving power of each menstruum is limited, and is determinate with regard to each solvend. The solubility of bodies is also limited and determinate with regard to each menstruum.

360. When any menstruum has dissolved the greatest possible quantity of any solvend, it is said to be saturated with it. Saturation is here employed in a different sense from what it is in regard to saturation between substances of opposite chemical qualities. To the latter, neutralization would be more appropriate. In some cases, a menstruum, although saturated with one substance, is still capable of dissolving others. Thus a saturated solution of muriate of soda will dissolve a certain quantity of nitrate of potass, and after that a portion of muriate of ammonia.

361. The dissolving power of solvents, and consequently the solubility of solvends, is generally increased by increase of temperature; and conversely, this power is diminished by diminution of temperature; so that, from a saturated solution, a separation of a portion of the solvend generally takes place on any reduction of temperature. This property becomes extremely useful in many chemical operations, especially in crystallization.

362. Some substances, as lime and magnesia, are rather more soluble in cold than in hot water. I have found the same property to be possessed by a peculiar principle in Mudar. The solubility of others is not affected by temperature, and in some there appears a singular and inexplicable anomaly, by which they are more soluble, less soluble, and again more soluble by progressive increments of heat, as in sulphate of soda and muriate and nitrate of baryta.

363. Particular terms have been applied to particular cases of solution.

364. The apparent solution of a fluid in the atmosphere is termed *Spontaneous evaporation.* It is promoted by exposing a large surface, by frequently renewing the air in contact with the surface, and by increase of temperature.

365. The quickness with which fluids evaporate is in proportion to the elasticity of their vapour, and this is sometimes so great as to be a source of much inconvenience. It appears that the nature of the covering by which they are attempted to be confined has considerable influence, and that it allows those vapours to pass most readily through it with which it has affinity.

366. Some salts have so strong an affinity for water, that they attract it from the atmosphere in sufficient quantity to dissolve them. They are said to *deliquesce.*

367. In old pharmacy, deliquescence was used as the means of obtaining a strong solution of some saline bodies; and, according to the Dublin Pharmacopœia of 1807, the *Aqua subcarbonatis kali* was still made in this fortuitous way; which, from its oiliness, was formerly called *Oleum tartari per deliquium.*

368. Deliquescent salts must be kept in a warm dry place; some, as muriate of lime, attract moisture from the driest air, and must be kept in very closely stopped bottles. Advantage is taken of this property in some pharmaceutic processes; as in the rectification of alcohol or ether.

369. Other salts, on the contrary, retain their water of crystallization with so weak a force, that the atmosphere attracts it from them, so that they crumble into powder. These are said to *effloresce.* Efflorescence, in this case, is owing to the evaporation of the water of crystallization, and hence it has been proposed to term it *Deaquescence,* to distinguish it from another kind of efflorescence, which takes place in iron-clay-slate, and on new plastered walls, which is owing to the shooting of acicular crystals from the absorption of water of crystallization.

670. Deaquescence is employed as a pharmaceutical process in the preparation of the *sulphas sodæ siccatum,* and it is promoted by exposing a large surface, and by a free current of warm dry air.

371. Solution is either total or partial. Total solution takes place when the solvend is of a homogeneous nature, and is entirely dissolved if the menstruum be used in sufficient quantity. Many examples of total solution occur in pharmacy.

Saline solutions of all kinds, acid, alkaline, neutral, earthy, metallic.

Mucilages; solutions of gum in water.
Syrups; solutions of sugar in water.
Tincture of pure resins and camphor in alcohol.
Solution of camphor in oil.
Solution of resin in oil.

372. Partial solution is when the body acted upon is of a heterogeneous nature, consisting of some principle or principles soluble, and of others insoluble in the menstruum employed; *e. g.* bone, from which, by means of boiling water, we can dissolve the gelatin, and leave the earthy phosphates; or, by means of weak acid, we can dissolve the earthy salt, and leave the gelatin.

373. Solution is therefore employed to separate substances (for example, saline bodies,) which are soluble in the menstruum, from others which are not.

374. In some cases, our object is to obtain the soluble substance in a state of purity: the operation is termed *lixiviation.* In this as small a quantity of the menstruum as is sufficient is used, in order that there may be less solution of heterogeneous matter, and less trouble in concentrating the solution. It is by lixiviation that the alkaline salts are extracted from the ashes of vegetable matters, and their solutions are termed Leys, *Lixivia.*

375. In other cases, solution is employed to free an insoluble substance from soluble impurities. It is termed *Edulcoration* *, which is best performed by using a very large quantity of the menstruum applied in successive quantities. The term edulcoration implies that the insoluble substance is to be washed with successive quantities of water, until it comes off insipid. Sometimes the taste is not trusted to; and a chemical test is employed, to ascertain that the water comes off unimpregnated.

376. Organic products being generally composed of heterogeneous substances, are only partially soluble in the different menstrua. To the solution of any of these substances, while the others remain undissolved, the term *Extraction* is applied; and when, by evaporation, the substance extracted is reduced to a consistent form, it is termed an *Extract.* The proper preparation of Extracts, so as to obtain in a

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* This process is called *Lotion* by MM. Henry and Guibourt. It differs from *Dilution,* which is a mere suspension in water of an insoluble body in a state of very great tenuity. It differs from the *washing* of roots, as employed before they are dried, as in this case the action of the water is entirely mechanical, and produces a separation or suspension of the foreign matters without solution.

small bulk the active principles of medicinal substances, is a very important process in pharmacy.

377. In the extraction of the active principles of organic substances, the menstruum is either applied cold, or is assisted by heat, and different titles have been given to the processes.

Cold extraction, includes infusion and maceration.

Hot extraction, digestion and decoction.

378. Extracts get the title of *hard* or *soft* according to the consistence to which they are reduced by evaporation, and are called *watery* or *spirituous* according to the menstruum employed.

379. *Infusion* * is employed to extract the virtues of aromatic and volatile substances, which would be dissipated by decoction, and injured by maceration, and to separate substances of easy solution from others which are less soluble. The process consists in pouring the menstruum upon the substances to be infused, placed in a proper vessel, covering it up, agitating it frequently, and after a due time straining or decanting off the liquor, which is then termed the Infusion, if water be the menstruum employed.

380. Watery infusions are extremely apt to spoil, and are commonly extemporaneous preparations. Sometimes a proportion of spirit, or tincture is added to make them keep longer.

381. Infusions are sometimes directed to be made with cold, sometimes with boiling water. The latter is more active, and on some occasions seems necessary for extracting the active principle, as in making common tea. In other cases the use of boiling water is inadmissible, in consequence of its either dissipating the specific aroma or other volatile matter, or its taking up some principle while hot, which it deposits on cooling: thus the cold infusion of cinchona remains transparent, while the hot infusion becomes turbid, and hence in the Pharmacopœia there are distinct formulæ for each.

382. Some substances yield their soluble matter slowly, and must be left a considerable time in contact with the menstruum. This is the case with substances whose cuticle is entire, as tea leaves; or their texture dense, as guaiac wood, or are somewhat resinous, as cinchona bark.

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* MM. Henry and Guibourt describe infusion to be performed by pouring boiling water on simples, and letting them cool together. This I would consider *hot* infusion, in contradistinction to infusion with *cold* water.

383. Others yield their soluble matter so readily, that when the menstruum is added in successive portions, the first is strong, the last weak, and it is necessary to mix them. This is daily observed in the preparation of coffee in the common coffee biggin.

384. Various means have been proposed and employed to assist the action of the menstruum. Count de la Garaye employed long trituration, and Real and Römershausen strong compression; but the advantages of neither method are equal to the expense.

385. *Maceration* differs from infusion, in being continued for a longer time. It can only be employed for substances which do not easily ferment or spoil. Most of the officinal infusions are directed to be macerated for a greater or shorter length of time. By protracting maceration too long, the preparation often turns out less elegant, as, in general, the finer aromatic and bitter principles are first dissolved, and then the coarser and mucilaginous principles.

386. *Digestion* differs from maceration only in the activity of the menstruum being promoted by a gentle degree of heat, from 60° to 90° Fahrenheit. It is commonly performed in a glass matrass, which should only be filled one-third, and covered with a piece of wet bladder, pierced with one or more small holes, so that the evaporation of the menstruum may be prevented as much as possible, without risk of bursting the vessel. The vessel may be heated, either by means of the sun's rays, of a common fire, or of the sand-bath; and when the last is employed, the vessel should not be sunk deeper in the sand than the portion that is filled. Sometimes, when the menstruum employed is valuable, a distilling apparatus is used to prevent waste. At other times, a blind capital is luted on, or a smaller matrass is inverted over a larger one; and as the vapour is condensed in it, and runs back into the larger matrass, the process in this form has got the name of *Circulation.*

387. *Decoction* is performed by subjecting the substances operated on to a degree of heat, which is sufficient to boil the menstruum. It can only be employed with advantage for extracting principles which are not volatile, and from substances whose texture is so dense and compact as to resist the less active methods of solution. When the menstruum is valuable, that portion of it which is converted into vapour is generally saved by condensing it in a distilling apparatus. Many decoctions, as those of all astringent substances, become turbid on cooling; and it is of importance to know the chemical nature of the deposit, as it is some-

times directed to be removed, and at other times to be preserved, often without any principle. Sometimes the action of the menstruum is increased by raising its temperature above its boiling point by means of compression, as in Papin's digester *.

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* MM. Henry and Guibourt have made some observations on these processes, which deserve to be considered.

Maceration, digestion, infusion and decoction have great analogy with solution, lotion and lixiviation; for the object of all is the solution of some principle in a liquid; but the last named processes are restricted to inorganic substances; while organic substances are generally the subjects of those first enumerated.

The pharmaceutists in former times used particular names for certain modifications of these processes. *Humectation* was the maceration or digestion of any substance in a small quantity of fluid, which only gave it a soft consistency. *Insolation* was a digestion performed by the heat of the sun. *Circulation* was digestion performed in a vessel of a particular shape, called a Pelican. Of *ebullition* and *coction* they made distinct operations; but they are only two effects, which may be obtained by several different operations. *Ebullition* is that particular agitation of a fluid over the fire, which is caused by the bubbles of vapour rising from the bottom, and occurs in distillation as well as in decoction; and with regard to coction, it is the softening of the organic fibre, and an internal solution of the juices of the body subjected to the heat, and this new state may be induced in different manners. We may thus say that decoction is an operation composed of three distinct effects; the *ebullition* of the liquid; the *coction* of the solid; and the *solution* of several principles of the solid in the liquid. Ancient pharmaceutists used also the word *elixation*, from *elixus*, boiled. They applied it to the operation now called decoction, which term they reserved for the product. MM. Henry and Guibourt think it might be retained by restricting it to that particular species of decoction, in which a great part of the liquid is evaporated, and which is intended to furnish two useful products, the liquid and the boiled solid; while in decoction, the liquid alone is made use of. In this sense, elixation holds a middle place between *assation* and *decoction*, and, as examples, may be quoted the boiling of emollient herbs in a small quantity of water to make a cataplasm of them, and the boiling of prunes to reduce them to a pulp. Almost all the ordinary culinary operations are elixations, and the common beef and broth *(pot-au-feu)* is a familiar example.

The French pharmaceutists use some other terms for particular processes, which have not been explained in the text of the Dispensatory. *Assation* is the roasting of soft or succulent substances in their own moisture, by exposing them to the fire, or placing them in hot cinders, or in a stove. Onions and squills are occasionally subjected to the operation. *Immersion* is the operation in which any body is plunged into warm or boiling water for some time, not with the view of using the liquid, but for the purpose of modifying the solid. Thus almonds are plunged in hot water to facilitate the removal of their epidermis, and eggs are immersed to coagulate them. Iceland moss is also immersed for an instant before proceeding to make a decoction of it, for the purpose of extracting its bitter, without affecting its gelatinous principle. Immersion differs from infusion and decoction in this respect, that the useful principle, instead of passing into the liquid, remains in the solid immersed. It resembles extinction, which strictly is a kind of immersion, although the object and means of the two operations are quite distinct. *Extinction* takes place when a red hot body is plunged into water. It is used to facilitate the division of very hard bodies, such as siliceous stones, which are not easily reduced into powder by the common operations. One extinction rarely suffices, and it is commonly necessary to repeat it several times. Extinction is also used figuratively, to express the reduction of mercury into extremely minute globules, conveying the same idea as the killing of quicksilver.

DECOMPOSITION.

388. *Decomposition* is the separation of bodies which were chemically combined.

389. It can only be effected by the agency of substances possessing a stronger affinity for one or more of the constituents of the compound, than these possess for each other, or when the divellent are more powerful than the quiescent affinities.

390. Decomposition has acquired various appellations, according to the phenomena which accompany it.

391. *Dissolution* differs from solution in being accompanied by the decomposition, or a change in the nature of the substance dissolved. Thus, we correctly say, a solution of lime in muriatic acid, and a dissolution of chalk in muriatic acid *.

392. Sometimes a gas is separated during the action of bodies on each other. When this escapes with considerable violence and agitation of the fluid, it is termed *effervescence* †. If the gas be very soluble in water, as carbonic acid or sulphuretted hydrogen, the effervescence is most considerable towards the end of the process, after the water has become saturated with it.

393. The gas is very frequently allowed to escape into the atmosphere, but at other times is either collected in a pneumatic apparatus, or made to enter into some new combination.—The vessels in which an effervescing mixture is made, should be high and sufficiently large, to prevent any loss of the materials from their running over; and in some cases the mixture must be made slowly and gradually.

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* This distinction between solution and dissolution was taken from a paper written by Mr Chenevix, and is generally observed in the Dispensatory. It nearly agrees with the explanation of the best French pharmaceutists. Thus, Henry and Guibourt say, that in solution there is no chemical action properly so called, as the bodies retain their respective properties. In dissolution, the body dissolved and the solvent have acquired new properties; one or other may be partially decomposed, sometimes both. Carbonell seems to consider both solution and dissolution as modes of disaggregation; but that in solution the body is resolved into its integrant particles; in dissolution, into its elementary particles.

† Effervescence is described, and perhaps more correctly, by Henry and Guibourt, to be the commotion produced in a liquid by the disengagement of a body which is passing into the state of gas. In this sense, it takes place from various causes. 1. By the removal of pressure from the surface of a liquid, as by uncorking a bottle of soda water. 2. By the reciprocal action of two fluids, as in making acetate of potass. 3. By the action of a fluid on a solid, as in the solution of carbonate of lime in any acid, or of iron in dilute sulphuric acid.

394. *Precipitation* * is the reverse of solution. It comprehends all those processes in which a solid is obtained by the decomposition of a solution. The substance separated is termed a *Precipitate*, if it sink to the bottom of the fluid, as is commonly the case; or a *Cream*, if it swim above it, as camphor. Precipitates occur in a great variety of forms, crystallized, amorphous, powdery, flaky, grumous, loose, adhesive. Precipitation, like solution, is performed, either *via humida*, or *via sicca*.

395. The objects of precipitation are,

1. The separation of substances from solutions in which they are contained;
2. The purification of solutions from precipitable impurities;
3. The formation of new combinations.

396. Precipitation is effected,

1. By lessening the quantity of the solvent by evaporation; Crystallization, Deposition;
2. By diminishing its solvent power;
   - *a.* By reduction of temperature; thus Kermes mineral is precipitated on the cooling of its solution.
   - *b.* By dilution, as in the precipitation of the submuriate of antimony, and subnitrate of bismuth.
3. Or by the addition of some chemical agent, which, from its more powerful affinities,
   - *a.* Either combines with the solvent, and precipitates the solvend; thus alkalies combine with the acids of metallic solutions, and precipitate the oxides.
   - *b.* Or forms an insoluble compound with some constituent of the solution, as baryta is precipitated from its solution in water, by sulphuric acid, forming with it a sulphate.
   - *c.* By double affinity, as when muriate of lime is decomposed by sulphate of potass.

397. The two first means of precipitation (396, 1, 2,) are rarely considered as instances of precipitation, as the sepa-

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* Precipitation is said, by MM. Henry and Guibourt, to take place when a body dissolved in a liquid becomes insoluble in it by the addition or subtraction of another body, and, in consequence of its weight, falls to the bottom. There are two kinds of precipitation. In the one, the precipitate exists previously in the solution, and in the other, it is formed at the moment of precipitation. Of the former, we have an example in the precipitation of a salt from its solution in water by the addition of alcohol, and of the latter, in the precipitation of carbonate of magnesia by the addition of a solution of subcarbonate of potass to one of sulphate of magnesia.

ration is gradual, and the separated matter often assumes determinate figures.

398. In performing precipitation in the last manner, (396–3), we may observe the following rules:

1. The solution and precipitant must possess the requisite degree of purity.
2. The solution should be perfectly neutralized to avoid unnecessary consumption of the solvent or precipitant.
3. The one is to be added slowly and gradually to the other. In some instances it is not immaterial whether the precipitant be added to the solution, or the solution to the precipitant, as in Mr Chenevix's mode of preparing James's powder.
4. After each addition, they are to be thoroughly mixed by agitation.
5. We must allow the mixture to settle, after we think that enough of the precipitant has been added, and try a little of the clear solution, by adding to it some of the precipitant: if any precipitation takes place, we have not added enough of the precipitant. This precaution is necessary, not only to avoid loss, but, in many instances, the precipitant, if added in excess, redissolves, or combines with the precipitate.

399. After the precipitation is completed, the precipitate is to be separated from the supernatant fluid, by some of the means already noticed, as decantation or filtration.

400. When the precipitate is the chief object of our process, and when it is not soluble in water, it is often advisable to dilute, to a considerable degree, both the solution and precipitant, before performing the operation. When it is only difficultly soluble, we must content ourselves with washing the precipitate, after it is separated by filtration. In some cases, the separation of the precipitate is much assisted by a gentle heat.

401. *Crystallization* is a species of precipitation, in which the integrant particles of the solvend, on separating from the solution, assume certain determinate forms, generally prismatic or pyramidal.

402. The conditions necessary for crystallization are,

1. That the integrant particles of the substance have a tendency to arrange themselves in a determinate manner when acted on by the attraction of aggregation;
2. That they be disaggregated, at least so far as to pos-

sess sufficient mobility to assume their peculiar arrangement;

3. That the causes disaggregating them be slowly and gradually removed, while the solution remains in a state of absolute rest.

403. The means by which the particles of bodies are disaggregated, so as to admit of crystallization, are, solution, fusion, vaporization, or mechanical division and suspension in a fluid medium.

404. The means by which the disaggregating causes are removed, are, evaporation, reduction of temperature, and rest.

405. The crystallization of dissolved substances is effected in various ways *.

a. By diminishing the quantity of the solvend;
  1. By adding a substance which has a strong attraction for the menstruum or solvent.
    aa. By adding alcohol, which withdraws the water; crystals of sugar are thus obtained from syrup, and of ammoniaret of copper from its solution in water.
    bb. Metals, as silver or lead, may be crystallized by slowly decomposing their solution in any acid, by the addition of a metal having a strong affinity to the acid.
  2. By evaporation.
    aa. Slow; favourable to regular crystallization, and chiefly employed for salts nearly as soluble in cold as in hot water.
    bb. Quick; necessary for deliquescent salts, as muriate of lime.

b. By diminishing the power of the solvent;
  1. By reduction of temperature. This is chiefly effective in regard to those salts whose solubility is increased by increase of temperature, and which are thus dissolved in greater quantity than the solvent can retain at a lower temperature. As this

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* According to MM. Henry and Guibourt, substances may be crystallized from their solutions in three different ways; 1. By making the solution by ebullition, and with such proportions that there is an excess of the solvend: the solvent thus takes up more than it can retain in solution when cold: 2. By evaporating, by means of heat, solutions not sufficiently concentrated to furnish crystals by cooling, or which have already furnished them: 3. By spontaneous evaporation.

is reduced, the excessive portion of salt separates in the most minute state of division, and the integrant molecules arrange themselves in their determinate form of crystallization.

2. By dilution. This is very doubtful.

c. By increasing the force of aggregation among the molecules of the dissolved body;

1. By the sudden admission of the pressure of the atmosphere. This is only applicable when the aggregative force had been suspended by excluding the pressure of the atmosphere, as is experimentally shewn with a solution of sulphate of soda.
2. By agitation or tremor, which brings the molecules into closer contact.
3. By the introduction of a nucleus, upon the angles and edges of which the crystallization begins.

406. When a crystal is about to be formed in a solution, it is supposed that a single integrant molecule first separates, and that around this, as a nucleus, other molecules arrange themselves in successive layers.

407. Crystals extend more horizontally than vertically, because the molecules of salts are heavier than their solutions.

408. Some salts, as muriate of ammonia and diabetic sugar, when crystallized by slow evaporation, are apt to vegetate and rise over the edges of the vessel in which they are crystallized, in consequence of the rising of the solution by capillary attraction through the ring of crystals formed around the upper surface; and in this way a succession of crystallizations shoot above those just formed. It is observed that vegetating crystals shoot towards the light, as if attracted by it. The vegetation of crystals is often troublesome, and is prevented by greasing the edge of the vessel.

409. Many substances, on crystallizing, retain a portion of water combined with them, which is essential to their existence as crystals, and is therefore denominated water of crystallization. Its quantity varies very much in different crystallized substances, and is determinate in regard to each. Other crystals contain no water, and are called *anhydrous.*

410. The liquid which remains after the crystals have separated from it is called the mother-water, and it is sometimes merely too dilute to furnish more crystals without farther concentration by evaporation; or it contains impurities, which prevent the crystallization of the last portion; or it contains only substances of a different nature, more soluble in water, or not crystallizable. Mother-waters are often turned to good account; thus, iodine is prepared from a

mother-water got by the soap-makers from kelp, and formerly wasted.

411. Crystals are either perfect or imperfect, regular or irregular, distinct or confused.

412. The beauty and size of the crystals depend upon the purity of the solution, its quantity, and the mode of conducting the evaporation and cooling.

413. Perfect crystals consist of integrant molecules of one kind with or without water of crystallization. The molecules attract each other, and have a tendency to exclude all other matters, whether crystallizable or not.

414. But crystals from impure solutions are seldom perfect at the first crystallization. The presence of foreign matter impedes the free motion and arrangement of the particles. An excessive number of nuclei are formed; the crystals are small, soft and spongy, and retain among their molecules portions of the fluid from which they have separated. Such crystals are purified by repeated solution and crystallization.

415. Some crystallizable substances, especially of a very compound nature, have a great affinity for colouring matter, and obstinately retain it; as in brown sugar-candy.

416. In general the presence of colouring matter prevents regular crystallization, and it is necessary to remove it, either by a solvent, as alcohol, which does not act upon the crystals; or more perfectly by animal charcoal, as in the purification of sulphate of quinia.

417. We may be assured of the purity of a substance whose crystals are hard, finely formed, and free from colour.

418. Confused crystallization takes place,

a. From large crystals penetrating each other in consequence of the nuclei being formed too near to each other; exemplified in fluor spar, sugar and alum;

b. From the crystallization being conducted too rapidly, so that too many nuclei are formed, and the molecules have not time to arrange themselves;

c. From the whole fluid mass crystallizing into one compact mass; as in crystallization by fusion and sublimation.

419. Crystalline texture in compact crystalline masses may be rendered manifest,

a. By immersion in water, which dissolves first those crystals last formed, and filling up the spaces among the more perfect crystals;

b. By washing over metallic surfaces, as tin-plate, with a weak acid, which acts in the same way.

420. The means by which bodies, which have been disaggregated by solution in a menstruum, are made to crystallize more regularly, vary according to the habitudes of the bodies with their solvents and with caloric.

421. When the salt is not more soluble in hot than in cold water, a succession of pellicles is formed, by means of gentle evaporation on the top of the solution, which either are removed, or permitted to sink to the bottom by their own weight; and the evaporation is continued until the crystallization be completed. These salts commonly contain little water of crystallization.

422. But when the salt is more soluble in boiling than in cold water, the evaporation is only continued until a drop of the solution, placed upon some cold body, shews a disposition to crystallize, or at farthest only until the first appearance of a pellicle. The solution is then covered up, and set aside to cool; and the more slowly it cools, the more regular are the crystals, which commonly contain much water of crystallization.

423. When very large and beautiful crystals are wanted, they may be obtained by laying well-formed crystals in a saturated solution of the same salt, turning them every day, and preserving the temperature very uniform. In this way their size may be considerably increased, though not without limitation; for after a certain time, they lose the sharpness of their angles and edges, and grow smaller instead of larger, in consequence of the solution becoming weak by separation of the saline matter, and then acting upon the crystals on the slightest increase of temperature.

424. When bodies are merely suspended in a state of extreme mechanical division, their crystallization is effected by rest and drying; as in starch and basaltes.

425. When they are disaggregated by fusion or vaporization, the regularity of their crystals depends on the slowness with which their temperature is reduced; for if cooled too quickly, their particles have not time to arrange themselves, and are converted at once into a confused or uniform solid mass. Thus glass, which, when cooled quickly, is perfectly uniform in its appearance, when cooled slowly, has a crystalline texture.

426. But in order to obtain crystals by means of fusion, it is often necessary, after the substance has begun to crystallize, to remove the part which remains fluid; for otherwise it would fill up the interstices among the crystals first formed, and give the whole the appearance of one solid mass. Thus, after a crust has formed on the top of melted sul-

phur, by pouring out the still fluid part, we obtain regular crystals.

427. As a process in pharmacy, crystallization is of great utility.

a. As a means of purifying saline substances.

b. As presenting crystallizable substances in an uniform state as to composition and concentration.

c. As enabling us, by mere inspection or slight examination, to recognise the nature of saline bodies and their degree of purity.

428. All substances in the act of crystallizing have a tendency to exclude foreign matters, whether crystallizable or not.

429. When the foreign matter is not crystallizable, it remains chiefly in the mother-water; but when its proportion is considerable, it has a tendency to prevent the separation of the crystalline substance, which is to be counteracted by rest and the insertion of a nucleus. Another inconvenience arising from the presence of uncrystallizable foreign matter, is that a portion of it remains interposed among the molecules of the crystals. From this they may be freed by repeated solution and crystallization.

430. Crystallizable substances, which are blended in the same solution, may be separated from each other,

a. By their different solubility in water at 60°. On slow evaporation the salts are deposited in succession, each separately, and the solution is to be poured off from those first formed as soon as the second salt begins to appear;

b. By difference of solubility at 212° and 60°. By boiling, that salt whose solubility is not much greater in boiling than in cold water, separates, on the wasting of the solvent, and may be removed by skimming or raking out, until the solution become nearly saturated with the salt much more soluble in boiling than in cold water, and which therefore crystallizes alone on the solution being allowed to cool. Thus carbonate of soda is separated from muriate of potass;

c. By suspending the crystallization of one salt until the other be separated. Thus, in the manufacture of alum and copperas, the latter is allowed to crystallize, and is removed before the portion of alkali is added, which is necessary for the crystallization of the alum;

d. By their different forms. Salts in general retain their distinctive form sufficiently to enable them to be separated, even when crystallized together from the same solution.

431. The uniformity of the constitution of substances well crystallized is so great, that there is no difficulty of making a solution of them of any degree of strength. The great advantage this affords in pharmacy may be strikingly illustrated by the difficulty of obtaining and preserving the preparations of uncrystallizable substances of uniform strength, and of ascertaining their actual strength.

432. Crystallized substances are often easily recognised by their external characters of

a. Form. To a scientific crystallographer, this is of itself sufficient; for, by a knowledge of the primary forms and their possible modifications, his skill in enucleating, by cleavage, the primary form from any modification, and the accurate admeasurement of angles, he can determine, almost with certainty, every species. By experience also, without a knowledge of scientific crystallography, most crystals are easily determined by their form alone.

b. Size. This character is not so decisive; yet there are some crystals which never exceed a certain size.

c. Grouping. This is also sometimes distinctive. Some crystals often occur distinct; others shoot in bundles from a common centre; others occur massive, either radiated or foliated; some loose and spongy, and others plumose.

d. Colour. Many crystals are in themselves pellucid or semipellucid; others white and almost opaque; some are necessarily coloured, blue, as sulphate of copper; green, as sulphate of iron.

e. Smell. Most salts are without odour, except the carbonate of ammonia, unless they be decomposed by heat, an acid or an alkali.

f. Taste is a very common means of distinguishing similar salts; the salts of each metal may be almost recognised by the taste, and the whole have a variety of that taste called metallic; the salts of magnesia, lime, potass, soda, are bitter; of alumina, astringent, and of ammonia, pungent; of the vegetable alkaloids, intensely bitter; the taste of alkalis is soapy; of acid salts, sour.

g. Hardness. Some salts are hard and brittle; others hard and elastic, as muriate of ammonia; some almost flexible, as benzoic acid.

h. Volatility. This property also characterises some salts, as the ammoniacal salts, oxide of arsenic.

i. Combustibility. By this test we are at once able to determine whether the salt under examination contains carbon in either its acid or alkali.

j. Solubility. Salts generally resembling each other often differ considerably in their solubility, either in water at different temperatures, or in alcohol.

k. Chemical tests. These, when necessary, are the most decisive of all characters, and whole treatises have been written on their application; but crystals will generally be known without them.

433. The variety of crystalline forms is almost infinite; yet each crystallizable substance assumes only a certain class of them, and never appears in forms belonging to other classes.

434. It is probable, however, that the integrant molecules of each species of crystallizable matter is always of the same form, and that the varied forms under which the same substance appears is owing to accidental causes, which interrupt the regular aggregation of the integrant molecules; and much ingenuity has been exercised to shew how these various modifications may be produced.

435. But natural crystals are easily divided into a number of smaller crystals, and, by analogy, these are supposed to be composed of integrant homogeneous molecules, which admit of no further subdivision.

436. In some instances, the form of the resulting aggregate crystals corresponds with the supposed form of the molecule; thus sea salt crystallizes often in cubes, which, when broken or split into fragments, always exhibits a cubical form; and it is evident, that by an aggregation of small cubes a large cube is easily produced.

437. In many instances, the form of the aggregate crystal differs from that of the integrant molecule, and this difference admits commonly of certain varieties, all of which, however, may be derived as modifications arising from the regular aggregation of the integrant particles being impeded according to certain laws.

438. It is evident, that in very rare cases only the increment of crystals can take place equally on all sides. If the nucleus attach itself to the bottom or sides of the containing vessel, one side remains without increment, and hence crystals extend more laterally than vertically. If it form at the surface of the solution, the increment will take place chiefly on the lower surface of the crystal and around it, as may be

seen in the slow crystallization of sea salt, which thus often forms hollow rectangular pyramids.

439. But very frequently the modifying cause is less evident, and the resulting form is modified in consequence of no addition of molecules attaching themselves to certain angles or edges of the nucleus, or of the crystal after it has acquired a certain size. To this omission of accretion, the term of *decrement* has been given, and various modes or laws of decrement have been pointed out.

440. In consequence of such decrement, an edge may not be completed, and it may be replaced by a plane, when the edge is said to be truncated; if the plane incline equally to the two adjacent primary planes, it is a tangent plane; if the edge be replaced by two planes, it is bevelled.

441. In like manner, the decrement may take place upon a solid angle, which may be replaced by a single plane, which is also called tangent when it inclines equally to the adjacent primary planes, or by three or other number of new planes.

442. By various combinations of such decrements, a number of resulting forms arise, in all of which, however, the form of the elementary molecule may be traced.

443. The form of the elementary molecule may, in many cases, be extracted by means of the property which crystals have of being cut or split in certain directions more readily than in others; and a crystal is said to have a triple, fourfold, or sixfold cleavage, according to the number of directions in which they can be split.

444. Crystals are symmetrical solids, bounded by at least four surfaces, connected by at least six edges, and terminating in at least four solid angles.

445. The surfaces of crystals, as they present themselves, are called their *natural planes,* in contradistinction to their *cleavage planes*, which are produced by splitting or cracking the natural crystal. The external surfaces are sometimes smooth, sometimes streaked.

446. The general forms of crystals are,
Pyramidal,
Prismatic,
Polyhedral.

447. The pyramidal have an angular base, and the edges, uniting their lateral faces, incline towards each other, and meet in a point or summit.

448. Pyramids are either single; or double, consisting of two similar and equal pyramids, united base to base.

449. Pyramids are distinguished by the number of the angles of the base or of the lateral faces; 3, 4, 5, 6 sided pyramids, and differ as to the acuteness or obtuseness of the summit angle of these faces ; acute and obtuse pyramids.

450. The prismatic crystals have an angular base, and the edges uniting their lateral faces are parallel, and are terminated by a plane parallel and similar to the base.

451. Prisms are either right, placed perpendicularly upon the base; or oblique, inclining from the perpendicular.

452. Prisms are distinguished by the number of lateral faces, 3, 4, 5, 6, 8 sided prisms ; the measurement of the angles of the base, and the proportionate height of the crystal to its base; tabular and long crystals.

453. Polyhedral crystals have not any proper base, but consist of a number of sides whose angles are indented between those of the contiguous sides, and which are arranged symmetrically around a centre.

454. They are distinguished by the number of the sides, their forms, and their angles.

455. Crystals are sometimes named from the total number of their sides, as tetrahedron, hexahedron, octohedron, dodecahedron, icosahedron, triacontahedron, enneacontahedron, when the number of sides is 4, 6, 8, 12, 20, 30, 90.

456. Crystals are also often named from the number of the edges, as trigonal, tetragonal, pentagonal, hexagonal, when the number of such edges is 3, 4, 5, 6, &c.

457. Hauy admits only three forms of integrant molecules;

1. The parallelopiped;
2. The triangular prism;
3. The regular tetrahedron.

458. He also reduces the primitive resulting forms to six;

1. The parallelopiped;
2. The regular octohedron ;
3. The octohedron with triangular faces;
4. The six-sided prism;
5. The dodecahedron with rhomboid faces;
6. The dodecahedron with isosceles triangular faces.

459. The following table shews Mr Brooke's enumeration of the primary forms, and of the integrant molecules from which he derives them :

Primary forms.	*Molecules.*
Cube.	Cube.
Regular tetrahedron.	
Regular octohedron.	
Rhombic dodecahedron.	

Primary forms.	*Molecules.*
Quadrangular prisms.	Similar prisms.
Octohedron with a square base.	Square prism.
Octohedron with a rectangular base.	Rectangular prism.
Octohedron with a rhombic base.	Rhombic prism.
Rhomboid.	Similar rhomboid.
Hexagonal prism.	Equilateral triangular prism.

460. The most common regular forms are arranged below.

PYRAMIDAL FORMS.

Tetrahedral.

1. Base and sides equilateral triangles. *Regular tetrahedron.*

Octohedral.

2. Square base with equilateral triangular faces. *Regular octohedron.*
3. Square base with isosceles triangular faces. *Octohedron with square base.*
4. Rectangular base with unequal isosceles triangular faces. *Octohedron with rectangular base.*
5. Rhombic base with equal scalene faces. *Octohedron with rhombic base.*

Dodecahedral.

6. Sides, twelve equal rhombs. *Rhombic dodecahedron.*

PRISMATIC FORMS.

Quadrangular base—right angled.

7. Base and faces all square. *Cube.*
8. Base square, sides rectangular. *Right prism with a square base.*
9. Base and sides rectangular. *Right rectangular prism.*

Quadrangular base—oblique angled.

10. Rhombic base and sides. *Rhomboid.*
11. Rhombic base, and square, or rectangular sides. *Right rhombic prism.*
12. Rhombic base, and sides oblique angled parallelograms. *Oblique rhombic prism.*
13. Base an oblique angled parallelogram; sides rectangular. *Right oblique angled prism.*
14. Base and sides oblique angled parallelograms. *Doubly oblique prism.*

Hexangular base.

15. Base a regular hexagon; sides rectangular or square. *Regular hexagonal prism.*

OXYGENIZEMENT.

461. Oxygenizement, in its most general sense, expresses the combination of any substance, simple or compound, with oxygen *, whatever may be the chemical nature of the product.

462. The combination of oxygen is the object of many chemical and pharmaceutical processes.

463. *Oxygenizement* is an example of chemical union, and is subjected to all the laws of affinity. It requires the presence and contact of oxygen, and of another substance possessing affinity for it.

464. By its union with oxygenizable substances, oxygen undergoes various changes in its properties. In various instances the compounds of oxygen are fluid or solid, opaque, coloured, incapable of supporting inflammation, and deleterious to animal or vegetable life. The changes which the oxygenizable bases undergo, are no less conspicuous. Their form, colour, taste, odour, density, permeability to light and electricity, specific caloric, and finally, their affinities, are often totally altered.

465. The bases capable of uniting with oxygen, are either simple undecomposed substances, yielding simple oxides and acids, as carbonic oxide and carbonic acid; or are compound bodies, which yield either compound oxides and acids, or more than one oxide or acid. Thus, vegetable substances have carbon and hydrogen for a base, and animal substances, carbon, hydrogen, and azote; vinegar and margaric acid are compound acids; but, by more vivid oxygenizement, they may be converted into two or three binary compounds, one of which is always carbonic acid.

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* *Oxygen* is the principle on which most of the chemical qualities of atmospheric air depend. Its tendency to combination is so strong, that it has never been procured in a separate state. Oxygen gas, or the combination of oxygen with caloric, is its most simple form. This is permanently elastic, transparent, inodorous, and insipid. 100 cubical inches at 60° Fahrenheit, and 30 inches mercurial pressure, weigh 33.195 grains. Its specific gravity in relation to water is 0.00135; and in relation to hydrogen, its specific gravity is 16 to 1; its power of refracting light 1958, hydrogen being 1000; and its capacity for heat 4.6, water being assumed as unity. It eminently supports inflammation, is necessary for respiration and vegetation, and is decomposed in all these processes; it constitutes 0.2 of the bulk of atmospheric air. Water at 60° takes up $\frac{1}{27}$ of its bulk of the gas. Oxygen is also a constituent in water, in all acids and metallic oxides, and in almost all animal and vegetable substances. It is separated from many of its combinations by the rays of the sun, especially the most refrangible; and in electric decomposition it is always attracted by the positive pole. It is, in fact, the most electro-negative of substances.

466. The simple substances, and probably also the compound bases, unite with definite proportions of oxygen, and they are named accordingly Protoxide, Deutoxide, Tritoxide, Quadroxide, as containing with each proportion of the radical 1, 2, 3 or 4 proportions of oxygen. When it is united with the maximum of oxygen, it is called a Peroxide; and when two proportions of the radical are united with one of oxygen, it is a Suboxide.

467. The oxides present a great variety of characters, some classes of which are distinguished by names. Water, the Alkalies, Earths, Metallic Oxides, and vegetable and animal substances are all oxides.

468. The same simple base also furnishes different acids according to the proportion of oxygen with which it is united, and chemists have endeavoured to distinguish them by terminations or prefixed particles. A less degree of acidity is indicated by the termination *ous*, as sulphurous; and a greater by *ic*, as sulphuric. Sometimes *Oxy* is prefixed, and sometimes with the addition of *Hyper*, to indicate an additional proportion of oxygen, as formerly Oxymuriatic acid and Hyperoxymuriatic acid. *Per* is sometimes prefixed to indicate saturation with oxygen in an acid, as Perchloric acid; and *Hypo* is prefixed to denote a less proportion of oxygen, as Hyposulphurous and Hyposulphuric acid.

469. Oxygenizable bases attract oxygen with very different degrees of force. This attraction is much influenced by temperature. Thus charcoal, which at ordinary temperatures seems to possess no attraction for oxygen, unites with it rapidly and almost inseparably, when heated to ignition.

470. In many instances, oxygenizement is so strongly opposed by cohesion, that it does not take place unless assisted by a degree of heat sufficient to melt or vaporize the oxygenizable base.

471. With regard to the phenomena of the combination, the oxygenizement may take place, either,

- *a.* Without the production of heat and light, as, for example, in the rusting of iron, the oxygenation of sulphurets and chlorides, to express which there is no other than the generic term *oxygenizement;* or,
- *b.* With the production of heat and light; *combustion.*
  1. In substances which remain fixed at the temperature necessary for their combustion, there is no other more specific term;
  2. In substances which exist as gases, or are previously reduced to the state of vapour by the temperature necessary, it is termed *inflamma-*

tion; and if it proceed with very great violence and rapidity, *deflagration.*

472. Oxygenizement is often accompanied by the extrication of caloric and light in a very conspicuous degree. To these the term combustion should be confined; and only such oxygenizable bases as are capable of exhibiting these phenomena are combustible *. These phenomena depend upon the new compound having a weaker affinity or less capacity than its constituents for light and caloric, which are therefore extricated.

473. The application of a degree of heat sufficient to convert the substance into vapour, is necessary for the kindling of inflammable solids and liquids.

474. *Deflagration*, from its violence, must always be performed with caution. The common mode of conducting this process is, to introduce the substances to be deflagrated together into any convenient vessel, commonly an iron-pot, or crucible, heated to redness. But to obviate any inconvenience, and to insure the success of the process, they are previously made perfectly dry, reduced to powder, and thoroughly mixed together. The compound is then deflagrated gradually, generally by spoonfuls; but we must take care always to examine the spoon, lest a spark should adhere to it, which might set fire to the whole mass. During the process, the portion introduced should be frequently stirred. Polychrest salt of the Edinburgh Pharmacopœia is prepared by deflagration, and this process is also employed to procure the protoxide of antimony for the preparation of tartar-emetic.

475. Combustion is performed with different intentions,

1. For the sake of the heat and light evolved;
2. For the sake of the compound formed of the combustible body with oxygen;
3. For the sake of the residuum remaining after the combustible principles have been wholly or partially removed by combustion.

476. Combustion for the sake of heat and light is performed in a great variety of apparatuses; and the general principles are to reduce as much as possible the quantity of combustibles consumed, and to economize the heat and light. This constitutes the important science of *Pyrotechny.*

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* MM. Henry and Guibourt very properly censure this expression of the term combination to every case of oxygenation, thus rendering these two terms synonymous.

477. The compounds formed by combustion have various forms of aggregation, and the apparatus employed must be adapted to the collecting and preserving each. Thus, combustion is sometimes employed to procure carbonic acid from charcoal; oxide of zinc from the metal; and their acids from sulphur and phosphorus.

478. Partial combustion is employed in the preparation of charcoal, or *Carbonization;* and total combustion for procuring the alkaline salts; *Incineration.*

479. Calcination, according to the French pharmaceutists, is when a body is exposed for a great length of time to the simultaneous action of a strong heat, and of the air.

480. It is performed with three intentions,

a. To disengage some of the constituents of the body, or to expel the carbonic acid and water from calcareous stones, to convert them into lime *(Calx);* or to expel from salts the water of crystallization, when this process is attended with noise, it is called *Decrepitation.*

b. To combine the oxygen of the atmosphere, in a fixed state, with metals; or to form what were formerly called metallic *calces;* as when lead is calcined in a reverberatory furnace.

c. To attain both ends at once; that is, to volatilize some principles of the body calcined, and to combine oxygen with the others. Thus, ores which contain sulphur and arsenic are roasted to expel these principles, and to oxidize the metal.

481. The oxygen necessary for the process of oxygenation may be derived from various sources.

1. Atmospheric air.
    - *a.* By mere exposure some metals, as potassium, get covered with a coating of oxide; and in many other processes, as in the acetous fermentation, oxygen is absorbed. The oxygen of the atmosphere is instantly absorbed by nitrous gas.
    - *b.* Some substances spontaneously absorb oxygen more rapidly with the phenomena of combustion and inflammation, or take fire on exposure to the atmosphere, as phosphuretted hydrogen gas and phosphorus.
    - *c.* Many substances exhibit the same phenomena when kindled, as alcohol, ether, wood, and inflammables generally, and are enabled, by the heat produced, to continue the process.

  - *d.* Other substances require the temperature to be artificially kept up to a certain degree to be oxidized in the open air.

2. Oxygen gas. In this the action in all the preceding cases is more energetic, and substances, which do not burn in the atmosphere, undergo combustion, as iron-wire, or even inflammation, as zinc-wire.
3. Atmospheric air, assisted by the presence of water. In this way the peroxide of iron is formed, and the rusting of some other metals occur.
4. Oxides.
   - *a.* Water alone. In this case hydrogen gas is evolved. If a piece of potassium be immersed under water, an effervescence of hydrogen gas takes place; if it be thrown upon the water, the hydrogen is kindled and inflamed. Sodium, and the bases of the earths, also decompose water.
   - *b.* Water, assisted by an acid. In this case, also, hydrogen gas is evolved. Thus, iron and zinc are oxygenized by dilute sulphuric acid, and iron by muriatic acid; copper and lead by vinegar.
   - *c.* Water, assisted by chlorine. In this case no hydrogen is evolved, but muriatic acid is formed at the same time with the oxide.
   - *d.* Metallic oxides, assisted by heat. In this way organic substances are now commonly analysed by mixture with peroxide of copper, which furnishes the necessary oxygen for the perfect oxygenation of their elements.
5. Acids, with evolution of the decomposed acid.
   - *a.* Sulphuric acid, in the preparation of the sulphate of mercury.
   - *b.* Nitric or nitrous, one of the most common means of oxidizing metals, as mercury, &c.
   - *c.* Nitromuriatic acid, or aqua regia; in this case the oxygen is furnished by the nitric acid, and the oxide is dissolved in the muriatic. This compound acid is used for metals which cannot decompose water, and whose oxides are soluble only in muriatic acid, as gold and platinum.
6. Nitrates. The oxygen is in these instances furnished by the decomposition of the nitric acid; and for this purpose, a degree of heat sufficient to produce deflagration is necessary.
7. Chlorates act in the same way as the nitrates; but they are too expensive for common use.

482. The different modes of oxygenizement are intended, either,

- *a.* To produce heat and light;
- *b.* To obtain an oxygenized product;
  - 1. An oxide, when the process may be termed *Oxidizement.*
  - 2. An acid, *Acidification.*
- *c.* To remove an oxygenizable substance.

483. Hydrogen, carbon, and nitrogen, are never, unless for experiment, oxygenized as simple substances.

484. Sulphur is converted into sulphuric acid by burning it in leaden chambers, or by deflagrating it with nitrate of potass; and phosphorus is acidified by inflammation in the atmosphere, or by nitric acid.

485. Of all the simple oxygenizable substances, the metals are most frequently combined with oxygen; and, as in consequence of this combination, they lose their metallic appearance, they were formerly said to be calcined or corroded.

486. The metals are susceptible of different degrees of oxygenizement, some of them even of acidification, and, in general, they are more oxygenized according to the rapidity of the process. When proceeding too slowly, it may be accelerated by heat; when too violent, it must be checked by diminution of temperature, as by plunging the vessel in which the operation is performed into cold water.

487. When the degree of oxygenizement is not very great, the oxide formed generally enters into combination with the acid employed, and forms a metallic salt; but when carried to its highest degree, the oxide is often insoluble in acids.

DISOXYGENIZEMENT OF METALLIC OXIDES AND ACIDS.

488. This process was formerly termed *reduction* or *revivification*, from its restoring the metals to their metallic splendour.

489. It is performed either *via sicca* or *via humida.*

490. The facility with which metals are reduced *via sicca* has been made the foundation of their classification.

- I. Metals whose oxides cannot be decomposed by heat without the addition of combustible matter.
  - *a.* Metals whose existence is inferred from analogy, but whose oxides have not been reduced.

Silicium.
Zirconium.
Aluminium.
Yttrium.
Glucinium.

b. Metals whose oxides are reducible by electricity, and by heat with certain combustibles.

1. Metals which decompose water at 60°.

Magnesium.
Calcium.
Strontium.
Barium.
Lithium.
Sodium.
Potassium.

2. Metals which require to be heated to redness to enable them to decompose water.

Manganese.
Zinc.
Iron.
Tin.
Cadmium.

3. Metals which are incapable of decomposing water at any temperature.

aa. Acidifiable,

Arsenic.
Molybdenum.
Chrome.
Tungsten.
Columbium.

bb. Oxidizable,

Antimony.
Uranium.
Nickel.
Cerium.
Cobalt.
Titanium.
Bismuth.
Copper.
Tellurium.
Lead.

II. Metals whose oxides can be reduced by heat alone.

1. Metals which are capable of absorbing oxygen from the atmosphere.

Mercury.
Osmium.

2. Metals which never absorb oxygen from the atmosphere.

Silver.
Palladium.
Rhodium.
Platinum.
Gold.
Iridium.

491. In pharmacy, those metallic oxides which resist the action of heat alone, are reduced by melting them in contact with charcoal, or substances which may be charred, such as oil, fat, resin, pitch, &c. Besides the charcoal, different saline fluxes are also added to facilitate the fusion of

the oxide, and to allow the globules of the reduced metal to fall through them and unite into a mass.

492. The oxide to be reduced is mixed with a sufficient quantity of any of these substances, and placed in the bottom of a crucible, which is afterwards filled up with charcoal powder, to prevent entirely the access of air. The crucible is then exposed for a length of time to a sufficiently high temperature, when a button of the metal will commonly be found in the bottom.

493. Upon the volatile metals, such as arsenic and zinc, this operation must be performed in a distilling or subliming apparatus, and the metal is condensed in the upper part, or distilled over.

494. Some metals may be also reduced *via humida* from their solutions.

a. By simple inflammables. If a piece of taffeta, moistened with a solution of gold or silver, be exposed to a stream of hydrogen, or sulphuretted hydrogen gas, the metal is revived. If a slip of charcoal be immersed in a solution of gold, and exposed to the light of the sun, or heated to 212°, it gets covered with metallic gold. If a piece of phosphorus be immersed in a solution of sulphate of copper, it gets coated with copper. In all these cases the inflammable attracts and removes the oxygen.

b. By another metal having a greater affinity for oxygen. When a plate of tin is immersed in a solution of nitro-muriate of gold, the gold is precipitated upon the tin in the form of the purple powder of Cassius. If a little mercury be placed in a dilute solution of nitrate of silver, a beautiful arborescent crystallization of silver, called *Arbor Dianæ*, is gradually formed. If a piece of zinc be suspended in a solution of sugar of lead, a fine foliated crystallization, called the Lead Tree, appears.

c. By a metallic protoxide having strong affinity for more oxygen. Gold is reduced from its solution by proto-sulphate of iron.

d. By several vegetable acids, especially oxalic acid, or binoxalate of potass, when carbonic acid is evolved by the union of the oxalic acid with the oxygen of the oxide.

e. By vegetable inflammables. Ether decomposes muriate of gold, and dissolves the metal. This solution is used for gilding steel.

f. By animal substances. Ivory decomposes a solution of nitrate of silver; and the spot, which at first appears black, becomes brilliant by rubbing.

495. The compound oxides, (vegetable and animal substances,) may be further oxygenized, by treating them with nitric acid. In this way various oxides and acids are formed, according to the nature of the oxide operated on, the quantity of the acid, and the mode of conducting the process.

496. These substances also undergo changes by gradually combining with the oxygen of the atmosphere. In some cases, this combination is attended with remarkable phenomena, which have been classed under the term *fermentation*.

497. There are many species of fermentation, some of which have scarcely been noticed, and others have been named from the products they afford.

1. The saccharine, which produces sugar.
2. The vinous, which produces wine, beer, and similar fluids.
3. The panary, which produces bread.
4. The acetous, which produces vinegar.
5. The putrefactive, which produces ammonia.

498. The same substances are sometimes capable of undergoing the first, second, fourth, and fifth; or the third, fourth, and fifth, successively, but never in a retrograde order.

499. The conditions necessary for most of them are,

1. The presence of a sufficient quantity of fermentable matter;
2. The presence of a certain proportion of water;
3. The contact of atmospheric air; and,
4. A certain temperature.

500. *The saccharine fermentation.*—The seeds of barley, when moistened with a certain quantity of water, and exposed to the contact of the atmospheric air, at a temperature of not less than 50°, swell, and shew marks of incipient vegetating, by pushing forth the radicle. If at this period the fermentation be checked, by exposing them to a considerable degree of heat, and drying them thoroughly, the insipid amylaceous matter, of which the seeds principally consisted, will be found to be changed in part into a sweet saccharine substance. The oxygen of the air, in contact with the seeds, is at the same time converted into carbonic acid gas, by combining with part of the carbon of the seeds; and there is a considerable increase of temperature in the fermenting mass, even to such a degree as sometimes to set it on fire. Similar phenomena occur in the maturation of

fruits; in the cookery of some roots and fruits, and during the heating of hay, when put up too wet. Starch may be converted into sugar, by boiling it for a long time with dilute sulphuric acid.

501. *The vinous fermentation.*—The conditions necessary for the vinous fermentation, are, the presence of proper proportions of sugar, ferment, and water, and a temperature of about 70°. The contact of air is not necessary. When these circumstances exist, an intestine motion commences in the fluid; it becomes thick and muddy, it swells up, its temperature increases, and much carbonic acid gas is evolved. After a time the fermentation ceases, the feces rise to the top, or subside to the bottom, the liquor becomes clear, it has lost its saccharine taste, and assumed a new one, and its specific gravity is diminished. If the fermentation has been complete, the sugar is entirely decomposed, and the fermented liquor consists of a large proportion of water, of alcohol, of malic acid, of extract, of essential oil, and colouring matter. The substances most commonly subjected to this fermentation are must, which is the expressed juice of the grape, and produces the best wines; the juice of the currant and gooseberry, which, with the addition of sugar, form our home-made wines; the juices of the apple and pear, which give cyder and perry; and an infusion of malt, which, when fermented with yeast, forms beer. The briskness and sparkling of some of these liquors depend on their being put into close vessels before the fermentation is completed, by which means a portion of carbonic acid is formed in the bottle, and escapes on uncorking it.

502. *The acetous fermentation.*—All vinous liquors are susceptible of the acetous fermentation, provided they be exposed to the action of the atmosphere in a temperature between 70° and 90°. An intestine motion and hissing noise sensibly take place in the fluid; it becomes turbid, with filaments floating in it, and its temperature increases; it exhales a pungent acid smell, without any disengagement of carbonic acid gas. Gradually these phenomena cease; the temperature decreases, the motion subsides, and the liquor becomes clear, having deposited a sediment and red glairy matter, which adheres to the sides of the vessel. During this process, the alcohol and malic acid disappear entirely, oxygen is absorbed, and acetous acid formed.

503. *The panary and colouring fermentation*—is less understood than those already described. A paste of wheat-flour and water, exposed to a temperature of 65°, swells, emits a small quantity of gas, and acquires new properties. The glu-

ten disappears, and the paste acquires a sour disagreeable taste. If a just proportion of this fermented paste or leaven, or, what is still better, if some barm, be formed into a paste with wheat-flour and water, the same fermentation is excited, without the disagreeable taste being produced; the gas evolved is prevented from escaping by the viscidity of the paste, which therefore swells, and if baked, forms light spongy bread.

504. *The putrefactive fermentation.*—Although vegetable substances, when they are destroyed by spontaneous decomposition, are said to putrefy, we shall consider this fermentation as belonging exclusively to animal substances, or those which contain nitrogen as an elementary principle. The essential conditions of putrefaction are humidity, and a temperature between 45° and 110°. The presence of air, and the addition of ferments, are not essential, but accelerate its progress. The smell is at first vapid and disagreeable, but afterwards insupportably fetid, although the fetor, for a time, is somewhat diminished by the mixture of an ammoniacal odour. Liquids become turbid and flocculent. Soft substances melt down into a gelatinous mass, in which there is a kind of gentle motion and swelling up, from the slow and scanty formation of elastic fluids. Solids, beside the general softening, exude a serosity of various colours, and by degrees the whole mass dissolves, the swelling ceases, the matter settles, and its colour deepens; at last its odour becomes somewhat aromatic, its elements are finally dissipated, and there remains only a kind of fat, viscid, and still fetid mould. The products of putrefaction are carburetted, sulphuretted, and phosphuretted hydrogen gases, water, ammonia, azote, and carbonic acid. These are all dissipated in the form of gas or vapour. When in contact with air, oxygen is absorbed. Acetic acid, a fatty matter, a soap composed of this fat and ammonia, and often the nitric acid, fixed by a salifiable base, are also produced; and the ultimate remains, besides earthy salts, contain for a long time a portion of fat charry matter.

505. Destructive distillation is a species of artificial fermentation, in which the tendency of the elements of organic bodies, to form simpler modes of union, is promoted by a high temperature.

506. When a vegetable substance is subjected to the destructive distillation in a close vessel, we find remaining in the retort the earthy and saline constituents in small quantity, together with a considerable proportion of the charcoal. In the receiver are condensed water with empyreumatic oil

and acetic acid, while a great quantity of carburetted hydrogen gas, impregnated with empyreumatic oil, is allowed to escape. The explanation of the change is evident. The oxygen divides itself between the hydrogen and carbon to form water and carbonic acid, or unites with both in acetic acid; the hydrogen forms water, acetic acid, oil and inflammable gas, while the carbon forms carbonic and acetic acid, empyreumatic oil and inflammable gas, and what is more than sufficient for these purposes remains fixed in the retort. This process is employed for the preparation of charcoal, of pyrolignic acid, and vegetable empyreumatic oils.

507. When animal substances containing much nitrogen is subjected to the same process, the products, on account of the difference of the elements, are somewhat different. The animal charcoal left in the retort contains more earthy constituents, and the true carbonaceous matter is more attenuated; no acetic acid is formed; but the carbonic acid is saturated with ammonia, while the empyreumatic oil is more fetid. In this way the greatest part of the ammonia for pharmaceutical purposes is got from bones, and also animal empyreumatic oils of different kinds are prepared.

508. In destructive distillation, without addition, and in common apparatus, the decomposition is not complete; some ternary combinations, as oil and acetic acid, are formed; but as the quantities of these are variable according to accidental circumstances, no certain information is afforded as to the ultimate constitution of the substances subjected to it; and the multiplied labours of Geoffroy, and the chemists of his school, are nearly useless. In modern times, however, by operating in well-contrived apparatus, exposing the subject to a sufficient degree of heat, and adding chlorate of potass, or rather peroxide of copper, to afford enough of oxygen to saturate all the bases, the elements of many organic products have been determined with the greatest exactness; as the only products procured in this way are water, carbonic acid, and nitrogen, which may be separated by easy means, and thus furnish certain data.

509. Gay Lussac and Thenard have concluded, that,

a. A vegetable substance, in which the oxygen exceeds the quantity necessary to unite with the hydrogen into water, is always acid;

b. When the proportion of oxygen is less than that sufficient to convert the hydrogen into water, it is oily, resinous or alcoholic;

c. When the proportions of oxygen and hydrogen are exactly those which form water, it is neither acid nor resinous.

APPENDIX.

WEIGHTS AND MEASURES.

ENGLISH.

PRINCIPLES OF THE NEW IMPERIAL WEIGHTS AND MEASURES.

The Commissioners, appointed for the important object of introducing uniformity of weights and measures in all parts of the empire, selected, from among the various standard measures in the custody of the Clerk of the House of Commons, one to be the only standard and unit measure of extension; and lest this should be lost, they ascertained its length at 62° Fahrenheit, in proportion to the length of a pendulum vibrating seconds of mean time in the latitude of London in a vacuum at the level of the sea; and this proportion they found to be as 36 to 39.1393.

A cubic inch of distilled water, weighed in air by brass weights at 62° Fahr. and 30° Bar. is equal to 252.458 troy grains *, of which 5760 are the imperial troy pound, and 7000 the avoirdupois pound.

A measure containing 10 avoirdupois pounds is the imperial standard gallon for liquid and dry goods not heaped.

For goods which may be sold heaped, the standard is a bushel, containing eighty pounds of water, being a cylindrical vessel, with a plain and even bottom, and 19 inches and a half from outside to outside, with the goods duly heaped in such bushel in the form of a cone, such cone being at least six inches high, with the outside of the bushel as its extremity. Three such bushels are a sack; twelve sacks a chaldron.

IMPERIAL STANDARD TROY WEIGHT.

By 5. George IV. cap. 74, it is enacted, That from and after the 1st day of May 1826, the standard brass weight of One pound, Troy weight, made in 1758, and now in the custody of the Clerk of the House of Commons, shall be the unit and only standard measure of weight; and that one-twelfth part of the said Troy pound shall be an ounce; one-twentieth part of such ounce a pennyweight; and one

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* The Dublin Pharmacopœia states, that a cubic inch of distilled water at 60° Fahr. weighs very nearly 252.5 Troy grains.

twenty-fourth part of such pennyweight a grain, so that five thousand seven hundred and sixty such grains shall be a pound; or

Gr.						
24	=	*Pennyweight.*				
480	=	20	=	*Troy Ounce.*		
5760	=	240	=	12	=	*Troy Pound.*

and that seven thousand such grains shall be a pound avoirdupois; and one-sixteenth part of such pound avoirdupois an ounce avoirdupois; and one-sixteenth of such ounce shall be a dram; or

Gr.						
27.34375	=	*Dram Avoirdupois.*				
437.5	=	16	=	*Ounce Avoirdupois.*		
7000.	=	256	=	16	=	*Pound Avoir.*

It therefore appears, that by the act, the Apothecaries weight, already in general use, and the Imperial Standard Troy weight, coincide exactly as to pounds, ounces and grains; but that the Troy dram and scruple, so constantly employed by apothecaries, are not recognised by the Legislature; while the Troy pennyweight is not employed by the apothecary; but these slight deviations would lead to no inconvenience, if the Avoirdupois weight were entirely abolished, which is not the case, and therefore there are still two different pounds and ounces; and the only dram recognised by the Legislature is the Avoirdupois dram, very different from the Apothecaries dram.

The *pound* Avoirdupois weight contains 7000 grains; the Imperial Standard Troy and the Apothecaries weight 5760.

The *ounce* Imperial Standard Troy and Apothecary contains 480 grains; Avoirdupois 437.5.

The *dram* Apothecary contains 60 grains; Avoirdupois 27.34375.

The *pennyweight* Troy contains 24 grains.

The *scruple* Apothecary 20 grains.

APOTHECARIES WEIGHT. *Lond. Ed. Dub.*

Pound.		*Ounces.*		*Drams.*		*Scruples.*		*Grains.*		*Grammes.*
℔ 1	=	12	=	96	=	288	=	5760	=	372.96
		℥ 1	=	8	=	24	=	480	=	31.08
				ʒ 1	=	3	=	60	=	3.885
						℈ 1	=	20	=	1.295
								gr. 1	=	0.06475

Table for converting Apothecaries Scruples, Drams, Ounces, and Pounds into Grains.

No.		*Scruple.*	*Dram.*	*Ounce.*	*Pound.*
¼	=	5.	15	120	1440 Grains.
½	=	10.	30	240	2880
1	=	20.	60	480	5760
2	=	40.	120	960	11520
3	=	60.	180	1440	17280
4	=		240	1920	23040
5	=		300	2400	28800
6	=		360	2880	34560
7	=		420	3360	41320
8	=		480	3840	46080
9	=			4320	51840
10	=			4800	57600
11	=			5280	
12	=			5760	

Table for converting Ounces, Drams, and Grains Troy into Decimals of the Apothecaries Pound.

Grains.	*lbs. Troy.*	*Drams.*	*lbs. Troy.*	*Oz.*	*lbs. Troy.*
1 =	.000173611	1 =	.0104166	1 =	.0833
2 =	.000347222	2 =	.0208333	2 =	.1666
3 =	.000520833	3 =	.0312500	3 =	.2500
4 =	.000694444	4 =	.0416666	4 =	.3333
5 =	.000868055	5 =	.0520833	5 =	.4166
6 =	.001041666	6 =	.0625000	6 =	.5000
7 =	.001215277	7 =	.0729166	7 =	.5833
8 =	.001388888			8 =	.6666
9 =	.001562500			9 =	.7500
				10 =	.8333
				11 =	.9166

Table for converting Decimals of the Apothecaries Pound into Apothecaries Ounces, Drams, and Grains.

lb.	*oz.*	*dr.*	*grs.*	*lbs.*	*oz.*	*dr.*	*grs.*	*lb.*	*grains.*
.1 =	1 :	1 :	36	.01 =	0 :	0 :	57.6	.001 =	5.76
.2 =	2 :	3 :	12	.02 =	0 :	1 :	55.2	.002 =	11.52
.3 =	3 :	4 :	48	.03 =	0 :	2 :	52.8	.003 =	17.28
.4 =	4 :	6 :	24	.04 =	0 :	3 :	50.4	.004 =	23.04
.5 =	6 :	0 :	0	.05 =	0 :	4 :	48.0	.005 =	28.80
.6 =	7 :	1 :	36	.06 =	0 :	5 :	45.6	.006 =	34.56
.7 =	8 :	3 :	12	.07 =	0 :	6 :	43.2	.007 =	40.32
.8 =	9 :	4 :	48	.08 =	0 :	7 :	40.8	.008 =	46.08
.9 =	10 :	6 :	24	.09 =	0 :	8 :	38.4	.009 =	51.84

AVOIRDUPOIS WEIGHT.

Pounds.		*Ounces.*		*Drams.*		*Troy Grains.*		*Grammes.*
1	=	16	=	256	=	7000	=	423.25
		1	=	16	=	437.5		28.32
				1	=	27.34375	=	1.81

Table for converting Avoirdupois Ounces into Decimals of the Avoirdupois Pound.

oz. Av.		*lbs. Av.*	*oz. Av.*		*lbs. Av.*
.25	=	.015625	8.00	=	.5000
.50	=	.03125	9.00	=	.5625
1.00	=	.0625	10.00	=	.6250
2.00	=	.1250	11.00	=	.6875
3.00	=	.1875	12.00	=	.7500
4.00	=	.2500	13.00	=	.8125
5.00	=	.3125	14.00	=	.8750
6.00	=	.3750	15.00	=	.9375
7.00	=	.4375			

Table for converting Decimals of the Avoirdupois Pound into Avoirdupois Ounces and Decimals.

lbs. Av.		*oz. Av.*	*lbs. Av.*		*oz. Av.*
.1	=	1.6	.01	=	.16
.2	=	3.2	.02	=	.32
.3	=	4.8	.03	=	.48
.4	=	6.4	.04	=	.64
.5	=	8.0	.05	=	.80
.6	=	9.6	.06	=	.96
.7	=	11.2	.07	=	1.12
.8	=	12.8	.08	=	1.28
.9	=	14.44	.09	=	1.44

Table for converting Apothecaries Pounds into their equivalent Avoirdupois Pounds and Decimals.

lbs. Troy.		*lbs. Avoirdup.*	*lbs. Troy.*		*lbs. Avoirdup.*
1	=	$0.8228571\dot{4}$	6	=	$4.9371428\dot{5}$
2	=	$1.6457142\dot{8}$	7	=	$5.7600000\dot{0}$
3	=	$2.4685714\dot{2}$	8	=	$6.5828571\dot{4}$
4	=	$3.2914285\dot{7}$	9	=	$7.4057142\dot{8}$
5	=	$4.1142857\dot{1}$			

Tables for converting Apothecaries Weight into Avoirdupois Weight.

TROY. dr.		AVOIRDUPOIS. dr.		gr.
1	=	2	:	5.3125
2	=	4	:	10.625
3	=	6	:	15.9375
4	=	8	:	21.25

TROY. dr.		AVOIRDUPOIS. dr.		gr.
5	=	10	:	26.5625
6	=	13	:	4.53125
7	=	15	:	9.84375
8	=	17	:	15.15625

TROY. oz.		AVOIRDUPOIS. oz.		gr.
1	=	1	:	42.5
2	=	2	:	85.
3	=	3	:	127.5
4	=	4	:	170.
5	=	5	:	212.5
6	=	6	:	255.

TROY. oz.		AVOIRDUPOIS. oz.		gr.
7	=	7	:	297.5
8	=	8	:	340.
9	=	9	:	382.5
10	=	10	:	425.
11	=	12	:	30.
10	=	13	:	72.5

TROY. lb.		AVOIRDUPOIS. lb.	oz.	gr.
1	=	0	13	72.5
2	=	1	10	145
3	=	2	7	217.5
4	=	3	4	290
5	=	4	1	362.5
6	=	4	14	435
7	=	5	12	70
8	=	6	9	142.5
9	=	7	6	215
10	=	8	3	287.5
11	=	8	0	360
12	=	9	13	432.5
13	=	10	11	67.5
14	=	11	8	140
15	=	12	5	212.5
16	=	13	2	285

TROY. lb.		AVOIRDUPOIS. lb.	oz.	gr.
17	=	13	15	359.5
18	=	14	12	430
19	=	15	10	65
20	=	16	7	137.5
30	=	24	10	425
40	=	32	14	275
50	=	41	2	125
60	=	49	5	412.5
70	=	57	9	262.5
80	=	65	13	112.5
90	=	74	0	400
100	=	82	4	250
200	=	164	9	62.5
300	=	246	13	312.5
400	=	293	2	125
500	=	411	6	375

Table for converting Avoirdupois Pounds into their equivalent Apothecaries Pounds and Decimals.

lbs. Avoird.		*lbs. Troy.*
1	=	1.215277
2	=	2.430555
3	=	3.645833
4	=	4.061111
5	=	6.076388

lbs. Avoird.		*lbs. Troy.*
6	=	7.291666
7	=	8.506944
8	=	9.722222
9	=	10.937500

Tables for converting Avoirdupois Weight into Apothecaries Weight.

AVOIRDUPOIS.		TROY.	
dr.		*dr.*	*gr.*
1	=	0	27.34375
2	=	0	54.68750
3	=	1	22.03125
4	=	1	49.37500
5	=	2	16.71175
6	=	2	44.06250
7	=	3	11.40625
8	=	3	38.75000
9	=	4	6.09375
10	=	4	33.43750
11	=	5	00.78125
12	=	5	28.13500
13	=	5	55.46875
14	=	6	22.81250
15	=	6	50.15625
16	=	7	17.50000

AVOIRDUPOIS.		TROY.		
oz.		*oz.*	*dr.*	*gr.*
1	=	0 :	7 :	17.5
2	=	1 :	6 :	35
3	=	2 :	5 :	52.5
4	=	3 :	5 :	10
5	=	4 :	4 :	27.5
6	=	5 :	3 :	55
7	=	6 :	3 :	2.5
8	=	7 :	2 :	20
9	=	8 :	1 :	37.5
10	=	9 :	0 :	55
11	=	10 :	0 :	22.5
12	=	10 :	7 :	50
13	=	11 :	6 :	57.5
14	=	12 :	6 :	5
15	=	13 :	5 :	22.5
16	=	14 :	4 :	40

AVOIRDUPOIS.		TROY.			
lb.		*lb.*	*oz.*	*dr.*	*gr.*
1	=	1	2	4	40
2	=	2	5	1	20
3	=	3	7	6	00
4	=	4	10	2	40
5	=	6	0	7	20
6	=	7	3	4	00
7	=	8	6	0	40
8	=	9	8	5	20
9	=	10	11	2	00
10	=	12	1	6	40
11	=	13	4	3	20
12	=	14	7	0	00
13	=	15	9	4	40
14	=	17	0	1	20
15	=	18	2	6	00
16	=	19	5	2	40

AVOIRDUPOIS.		TROY.			
lb.		*lb.*	*oz.*	*dr.*	*gr.*
17	=	20	7	7	20
18	=	21	10	4	.00
19	=	23	1	0	40
20	=	24	3	5	20
30	=	36	5	4	00
40	=	48	7	2	40
50	=	60	9	1	20
60	=	72	11	0	00
70	=	85	0	6	40
80	=	97	2	5	20
90	=	109	4	4	00
100	=	121	6	2	40
200	=	243	0	5	20
300	=	364	7	0	00
400	=	486	1	2	40
500	=	607	7	5	20

SCOTCH TROY WEIGHT.

Standard Troy
Grains.
29.75 = *Drop.*
476. = 16 = *Ounce.*
7616. = 256 = 16 = *Pound.*
121896. = 4096 = 256 = 16 = 1 *Stone.*

SCOTCH TRON WEIGHT.

Standard Troy Grains.				
29.75	= *Drop.*			
476.	= 16	= *Ounce.*		
9520.	= 320	= 20	= *Pound.*	
152320.	= 5210	= 320	= 16	= 1 *Stone.*

IMPERIAL STANDARD MEASURE.

By 5. Geo. IV. cap. 74, it is enacted, That from and after the 1st day of May 1826, the unit and only standard measure of capacity shall be the Imperial Standard Gallon, containing ten pounds avoirdupois weight of distilled water, weighed in air at 62° Fahr. and 30 inches bar.; that the quart shall be the fourth part of such gallon; the pint the eighth part; that two such gallons shall be a peck; eight a bushel; and eight bushels a quarter; or

Qr.	*Bush.*	*Peck.*	*Gall.*	*Quart.*	*Pint.*	*Cubic inches.*	*Aver. lbs.*	*Troy grs.*
1	= 8	= 32	= 64	= 256	= 512	= 17745.536	= 640	
	1	= 4	= 8	= 32	= 64	= 2218.192	= 80	
		1	= 2	= 8	= 16	= 554.548	= 20	
			1	= 4	= 8	= 277.274	= 10	= 70,000
				1	= 2	= 69.3185	= 2.5	= 17,500
					1	= 34.65925	= 1.25	= 8,750

MEASURE, LONDON PHARMACOPŒIA.

Gal.	*Pints.*	*Fluidoun.*	*Fluidr.*	*Scr.*	*Minims.*	*Troy Grains* *.	*Cub. Inch.*	*Litres.*
1	= 8	= 128	= 1024	= 3072	= 61440	= 58317.7980	= 231	= 3.78515
	O 1	= 16	= 128	= 384	= 7680	= 7289.7250	= 28.875	= 0.473144
		f℥ 1	= 8	= 24	= 480	= 455.6075	= 1.8047	= 0.029571
			fʒ 1	= 3	= 60	= 50.9500	= 0.2256	= 0.00369
				f℈ 1	= 20	= 18.9840	= 0.0752	= 0.000132
					♏ 1	= 0.9492	= 0.00376	= 0.0000616

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* The calculations in the text were made by myself, from the official data, at 62° Fahr. The Dublin College estimates the number of grains of distilled water which each denomination of measure contains at 60° Fahr. as below,

Gallon.	*Pint.*	*Fluid oz.*	*Fluid dr.*	*Fluid scr.*	*Minim.*
58327.5	7291 *q.p.*	455.6	57	19	1

The Dublin Pharmacopœia directs, that whenever it prescribes a pound, (libra,) it is understood to be a measured pound or pint.

COMPARISON OF MEASURES.

Gallon, imperial standard, contains 10 lbs. avoirdupois of distilled water, or 70,000 troy grains, or 277.274 cubic inches; apothecaries and former wine measure 58317.798 troy grains, or 231 cubic inches, the ratio being very nearly as 6 to 5, or, more accurately, as 1 to 0.833111.

Pint, imperial standard, contains 17500 troy grains, or 34.65925 cubic inches; apothecaries measure contains 7305 troy grains, or 28.875 cubic inches, the ratio being the same as in the gallon *.

FORMER ENGLISH WINE MEASURE †.

Ton.	Pipe or Butt.	Punch.	Hogsh.	Tierce.	Bar.	Rundlet.	Gallon.	Quart.	Pint.	Quarterns.	Cub. Inch.
1	2	3	4	6	8	14	252	1008	2016	8064	58212
	1	$1\frac{1}{2}$	2	3	4	7	126	504	1008	4032	29106
		1	$1\frac{1}{3}$	2	$2\frac{2}{3}$	$5\frac{2}{9}$	84	336	672	2688	19404
			1	$1\frac{1}{2}$	2	$3\frac{1}{2}$	63	252	504	2016	14553
				1	$1\frac{1}{2}$	$2\frac{1}{3}$	42	168	336	1344	9702
					1	$1\frac{3}{4}$	$31\frac{1}{2}$	126	252	1008	7276.5
						1	18	72	144	576	4158.
							1	4	8	32	231.
								1	2	8	57.75
									1	4	28.875
										1	7.219

FORMER ENGLISH ALE MEASURE.

Hogsh.	*Barrel.*	*Kilderk.*	*Firkin.*	*Gallon.*	*Quart.*	*Pint.*	*Cub. Inch.*
1	$1\frac{1}{2}$	3	6	51	204	408	14382
	1	2	4	34	136	272	9588
		1	2	17	68	136	4794
			1	$8\frac{1}{2}$	34	68	2397
				1	4	8	282
					1	2	$70\frac{1}{2}$
						1	$35\frac{1}{4}$

In London, 36 gallons were allowed to the barrel of beer, and 32 gallons of ale.

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* The Dublin Pharmacopœia gives an easy method of converting the Apothecaries Measure of each denomination, into the new Imperial Standard Measure, *viz.* by adding one-fifth.

† According to the reviewer of the Dublin Pharmacopœia, in the fifth number of the Dublin Philosophical Journal, p. 333, it is stated, that, "in compounding a physician's prescription, all the active fluids are measured by the Wine Gallon Measure, and the aqueous basis by the Irish Standard Measure of 217.6 cubic inches to the gallon. He does this because apothecaries' phials are always made according to the Irish gallon; and because, were one apothecary to act differently from the rest of his brethren, he would chance to lie under a tacit imputation, in the mind of the patient, of compounding incorrectly, because differently, from others." It is time that this abuse was put an end to.

FORMER SCOTS LIQUID MEASURE.

Bar.		*Gal.*		*Quart.*		*Pint.*		*Choppin.*		*Mutchkin.*		*Gills.*		*Cub. Inch.*
1	=	8	=	32	=	64	=	128	=	256	=	1024	=	6720
		1	=	4	=	8	=	16	=	32	=	128	=	840
				1	=	2	=	4	=	8	=	32	=	210
						1	=	2	=	4	=	16	=	105
								1	=	2	=	8	=	52.5
										1	=	4	=	26.25
												1	=	6.56

	Cubic Inches.		*Apothecaries Pint.*		*Imperial Pint.*
1 lb. Troy, - -	22.8157	=	0.78987	=	0.6583
1 lb. Avoirdupois, -	27.7274	=	0.95992	=	0.7999

Table for converting Apothecaries Pints of Water into their equivalent Apothecary Pounds and Decimals and Avoirdupois Decimals.

Pints.		*Troy. lbs.*	*oz.*	*dr.*	*grs.*		*lbs. Troy.*		*lbs. Avoirdupois.*
1	=	1	3	1	32.3	=	1.2659	=	1.04175
2	=	2	6	3	4.6	=	2.5319	=	2.08351
3	=	3	9	4	36.9	=	3.7979	=	3.12527
4	=	5	0	6	9.2	=	5.0639	=	4.16728
5	=	6	3	7	41.5	=	6.3299	=	5.20878
6	=	7	7	1	13.8	=	7.5958	=	6.25054
7	=	8	10	2	46.1	=	8.8618	=	7.29230
8	=	10	1	4	18.4	=	10.1277	=	8.33406
9	=	11	4	5	50.7	=	11.3937	=	9.37581

Table for converting Apothecary or English Ale Gallons into Imperial Standard Measure.

Apothecary.		*Imperial.*	*Ale.*		*Imperial.*
1000	=	833.11	1000	=	1017.04
2000	=	1666.22	2000	=	2034.09
3000	=	2499.33	3000	=	3051.13
4000	=	3332.44	4000	=	4068.18
5000	=	4165.56	5000	=	5085.22
6000	=	4998.67	6000	=	6102.27
7000	=	5831.78	7000	=	7119.31
8000	=	6664.89	8000	=	8136.36
9000	=	7498.00	9000	=	9153.40
10000	=	8331.11	10000	=	10170.45

EXAMPLE.—*Suppose we wish to know how many Imperial Gallons are equal to 9643 Apothecary.*

9000 = 7498.00
600 = 499.867
40 = 33.3244
3 2.49933

Apothecary 9643 = 8033.69073 Imperial.

Table for converting Imperial Standard Measure into Apothecary.

Imperial.		*Apothecary.*	*Imperial.*		*Apothecary.*
1	=	1.2	10	=	12
2	=	2.4	20	=	24
3	=	3.6	30	=	36
4	=	4.8	40	=	48
5	=	6.0	50	=	60
6	=	7.2	60	=	72
7	=	8.4	70	=	84
8	=	9.6	80	=	96
9	=	10.8	100	=	108

Table for converting Cubic Inches of Water (at 62° Fahr. and 30. Bar.) into their equivalents in Apothecary Weight.

Cub. Inch. of Water.		*Troy gr.*		*oz.*	*drum.*	*grs.*
1	weighs	252.458	=	0	4	12.458
2	——	504.916	=	1	0	24.916
3	——	757.374	=	1	4	37.374
4	——	1009.832	=	2	0	49.832
5	——	1262.296	=	2	5	2.296
6	——	1514.748	=	3	1	14.748
7	——	1767.206	=	3	5	27.206
8	——	2019.064	=	4	1	39.664
9	——	2272.128	=	4	5	52.128
1728 (1 cub. foot)		436247.424	=	908	6	47.424

Table for converting the Ounce Measure used by Dr Priestley into Cubical Inches.

Ounce Measures.	*French Cubical Inches.*	*English Cubical Inches.*
1	1.567	1.898
2	3.134	3.796
3	4.701	5.694
4	6.268	7.592
5	7.835	9.490
6	9.402	11.388
7	10.969	13.286
8	12.536	15.184
9	14.103	17.082
10	15.670	18.980
20	31.340	37.960
30	47.010	56.940
40	62.680	75.920
50	78.350	94.900
60	94.020	113.880
70	109.690	132.860
80	125.360	151.840
90	141.030	170.820
100	156.700	189.800
1000	1567.000	1898.000

LONG MEASURE.

Metres.

0.0085= 1 *Barleycorn.*

0.0254= 3= 1 *Inch.*

0.3048= 36= 12= 1 *Foot.*

0.9144= 108= 36= 3 = 1 *Yard.*

5.0291= 594= 198= 16½= 5½= 1 *Pole or Perch.*

201.1632= 23760= 7920= 660 = 220 =40=1 *Furlong.*

1609.3059=190080=63360=5280 =1760 =32=8=1 *Mile.*

Correspondence between English and Foreign Weights and Measures.

Weights and Measures used in France before the Revolution.

DIVISION OF FRENCH WEIGHTS.

Pound.	*Marc.*	*Ounces.*	*Gros.*	*Deniers.*	*Grains.*	*Troy grs.*	*Grammes.*
1 Poids de Marc	2. =	16 =	128 =	384 =	9216 =	7561 =	489.5058
1 Apothecary	1.5. =	12 =	96 =	288 =	6912 =	5670.5 =	367.1294
Marc	1 =	8 =	64 =	192 =	4608 =	3780.5 =	244.7529
		1 =	8 =	24 =	576 =	472.5 =	30.5941
			1 =	3 =	72 =	59.1 =	3.8242
				1 =	24 =	19.7 =	1.2747
					1 =	0.8 =	0.0531

Poids de Marc.	*Troy grains.*	
The pound =	7561	= 1.31268 lb. troy.
The ounce =	472.5625	= 0.984504 oz. troy.
The gros =	59.0703125	= 0.984504 dram.
The grain =	0.820421	

The English troy pround of 12 ounces	= 7021	Paris grains.
The Troy ounce - - -	= 585.083	
The dram of 60 grains - -	= 73.135	
The pennyweight or denier of 24 grains	= 29.254	
The scruple of 20 grains -	= 24.378	
The grain - - - - -	= 1.219	
The avoirdupois pound of 16 ounces, or 7000 troy grains,	= 8532.5	Paris grains.
The ounce - - -	= 533.625	

To reduce Paris grains to English grains, divide by English grains to Paris grains, multiply by	1.2189
Paris ounces to English troy ounces, divide by English troy ounces to Paris ounces, multiply by	1.015734
Pound (Poids de Marc) to troy pound, multiply by Troy pound to pound Poids de Marc, divide by	1.31268

Table shewing the Comparison between English and French Weights (Poids de Marc.)

English Grs.		*French Grs.*	*English Grs.*		*French Grs.*
1	=	1.2189	9	=	10.9704
2	=	2.4378	10	=	12.1890
3	=	3.6568	20	=	24.378
4	=	4.8757	30	=	36.568
5	=	6.0947	40	=	48.757
6	=	7.3136	50	=	60.947
7	=	8.5325	60	=	73.136

French Grs.		*Troy Grs.*	*French Grs.*		*Troy Grs.*
1	=	0.820421	10	=	8.20421
2	=	1.640842	20	=	16.40842
3	=	2.461263	30	=	24.61263
4	=	3.281684	40	=	32.81684
5	=	4.102105	50	=	41.02105
6	=	4.922526	60	=	49.22526
7	=	5.742947	70	=	57.42947
8	=	6.563368	72	=	59.070312
9	=	7.383789			

Fr. Gros.		*Troy Drs. Grs.*	*Fr. Gros.*		*Troy Drs. Grs.*
1	=	0 : 59.07	5	=	4 : 55.35
2	=	1 : 58.14	6	=	5 : 54.42
3	=	2 : 57.21	7	=	6 : 53.49
4	=	3 : 56.28			

Fr. oz.		*Troy oz.*	*Drs.*	*Grs.*
1	=	0	7	52.56
2	=	1	7	45.12
3	=	2	7	37.68
4	=	3	7	30.24
5	=	4	7	22.80
6	=	5	7	15.36
7	=	6	7	7.92
8	=	7	7	0.48
9	=	8	6	53.04
10	=	9	6	45.60
11	=	10	6	38.16
12	=	11	6	30.72
13	=	12	6	23.28
14	=	13	6	15.84
15	=	14	6	8.40

Fr. pounds.		*Tr. oz.*	*dr.*	*grs.*
1	=	15	6	1
2	=	31	4	2
3	=	47	2	3
4	=	63	0	4
5	=	78	6	5
6	=	94	4	6
7	=	110	2	7
8	=	126	0	8
9	=	141	6	9

LONG MEASURE.

		French. *feet.*	*inches.*	*lines.*		*English Inches.*
The French ell, *Aune*	=	3 +	7 +	1.05	=	46.69
The half toise	=	3			=	38.355
		English Foot.				
The French foot	=	1.0654167			=	12.785
The inch					=	1.0654
The line					=	0.0888
		French Foot.				*French Inches.*
The English foot	=	0.9386			=	11.2632
The inch					=	0.9386
The line					=	00.7823

To reduce French feet or inches to English feet or inches, multiply by 1.0654167, or divide by 0.9386.

To reduce English long measure to French, multiply by 0.9386, or divide by 1.0654167.

Tables expressing the value of French feet and inches in English Measure.

French feet.		*English inches.*
1	=	12.785
2	=	25.570
3	=	38.355
4	=	51.140
5	=	63.925
6	=	76.710
7	=	89.495
8	=	102.280
9	=	115.065
10	=	127.850

Fr. feet or in.		*Eng. feet or in.*
1	=	1.0654 +
2	=	2.1308
3	=	3.1962
4	=	4.2616
5	=	5.3270
6	=	6.3925
7	=	7.4579
8	=	8.5233
9	=	9.5887
10	=	10.6541

FRENCH MERIDIONAL OR DECIMAL WEIGHT.

'To employ, as the fundamental unity of all measures, a type taken 'from nature itself, a type as unchangeable as the globe on which we 'dwell,—to propose a metrical system, of which all the parts are intimately connected together, and of which the multiples and subdivisions follow a natural progression, simple, and easy to comprehend: '—this is most assuredly a beautiful, great, and sublime idea, worthy 'of the enlightened age in which we live.'

Such were the ideas which influenced the French National Institute, when they chose, as the base of the whole metrical system, the fourth part of the terrestrial meridian, between the equator and the north pole. They adopted the ten millionth part of this arc for the unity of measure, which they denominated *metre*, and applied it both to superficial and solid measure, taking for the unity of the former, *are*, the square of the decuple, and for that of the latter, *litre*, the cube of the tenth part of the metre. They chose for the unity of weight, *gramme*, the quantity of distilled water which the same cube contains when reduced to a constant state presented by nature itself; and, lastly, they decided, that the multiples and submultiples of each kind of measure, whether of weight, capacity, or length, should be always taken in the decimal progression, as being the most simple, the most natural, and the most easy for calculation, according to the system of numeration which all Europe has employed for centuries, and they used the prefixes, *deca*, *hecto*, *kilo*, and *myria*, taken from the Greek numerals, to express the multiplication of the integer by 10, 100, 1000, and 10,000 respectively, and *deci*, *centi*, *milli*, taken from the Latin numerals, to express its division.

By a careful measurement of the arc between Dunkirk and Mountjoy, they found the length of the metre to be equal to 443.296 lines of the toise. The cubic decimetre of distilled water, taken at its maximum of density and weight *in vacuo*, that is, the unity of weight, was found to be 18827.15 grains of the pile of Charlemagne.

Basis of comparison between English and French Metrical Weights and Measures.

The *metre* at 32° = 39.371 English inches at 62°.
The square metre = 1550.075641 English square inches.
The square decimetre = 15.50075 English square inches.
100 *ares* or square decametres = 2 English acres nearly.

Cub. feet. cub. inch.
The cubic metre = 61028.028 English cubic inches = 355 + 48.028.
The cubic decimetre, or *litre* = 61.028 English cubic inches.
Equal to the bulk of a kilogramme of water = 1000 grammes.

Troy gr.
The gramme or weight of a cubic centimetre of water = 15.44402 [*].

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[*] It is upon this basis that all the following tables have been constructed; but it has been recently ascertained, at the London Mint, from attested standards

MEASURES OF LENGTH:

The metre being at 32°, and the foot at 62°.

		English inches.		*Mil.*	*Fur.*	*Yards.*	*Feet.*	*Inch.*
Millimetre	=	.03937						
Centimetre	=	.39371						
Decimetre	=	3.93710						
Metre	=	39.37100	=	0	0	1	0	3.7
Decametre	=	393.71000	=	0	0	10	2	9.7
Hecatometre	=	3937.10000	=	0	0	109	1	1
Kilometre	=	39371.00000	=	0	4	213	1	10.2
Myriametre	=	393710.00000	=	6	1	156	0	6

Metre.		*Eng. feet.*		*Inches.*	*Decimetre.*		*Eng. inches.*
1	=	3	:	3.371	1	=	3.9731
2	=	6	:	6.742	2	=	7.8742
3	=	9	:	10.113	3	=	11.8113
4	=	13	:	1.484	4	=	15.7484
5	=	16	:	4.855	5	=	19.6855
6	=	19	:	8.226	6	=	23.6226
7	=	22	:	11.597	7	=	27.5597
8	=	26	:	2.968	8	=	31.4968
9	=	29	:	6.339	9	=	35.4339

MEASURES OF CAPACITY.

		English cubic inches.			
Millilitre	=	.06103	=	16.3 ♏.	Apothecary.
Centilitre	=	.61028	=	2.705 fldr.	
Decilitre	=	6.10280	=	3.381 floz.	
Litre	=	61.02800	=	2.113 octar.	
Decalitre	=	610.28000	=	2.642 galls.	
Hecatolitre	=	6102.80000	=	22.01 gallons.	Imperial.
Kilolitre	=	61028.00000	=	27.51 bushels.	
Myrialitre	=	610280.00000	=	34.39quarters.	

Litre.		*Eng. cub. inch.*		*Imperial pints.*		*Wine pints.*		*Oz. Troy of water.*
1	=	61.028	=	1.7608	=	2.11353	=	31.104
2	=	122.056	=	3.5216	=	4.22706	=	64.208
3	=	183.084	=	5.2822	=	6.34059	=	96.312
4	=	244.112	=	7.0430	=	8.45412	=	128.416
5	=	305.140	=	8.8038	=	10.56765	=	160.520
6	=	366.168	=	10.5646	=	12.68118	=	192.624
7	=	427.196	=	12.3253	=	14.79471	=	224.728
8	=	488.224	=	14.0861	=	16.90824	=	256.832
9	=	549.252	=	15.8469	=	19.02177	=	288.936

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sent by Mr Morier, our Consul-General at Paris, and by the agreement of several other standards, sent by other British Consuls in France, that the kilogramme is only 15,434, instead of 15,444 troy grains, and that the French weight has been overrated $\frac{1}{1544}$. I have retained the calculations formerly made; but for the important effects of the error in regard to money transactions, the reader is referred to page 140 of the first volume of Kelly's Universal Cambist, edit. 1821.

MEASURES OF WEIGHT.

		English grains.		TROY.			
				Pounds.	*Oun.*	*Dram.*	*Grains.*
Milligramme	=	.0154					
Centigramme	=	.1544					
Decigramme	=	1.5444					
Gramme	=	15.4440					
Decagramme	=	154.4402	=	0	0	2	344
Hecatogramme	=	1544.4023	=	0	3	0	44
Kilogramme	=	15444.0234	=	2	8	1	24
Myriagramme	=	154440.2344	=	26	9	6	0

Gram.	*Troy grs.*	*Deca-gram.*	*Troy dram.*	*grs.*	*Hecto-gram.*	*Troy oz.*		*Avoird. oz.*
1. =	15.444	1. =	2 :	34.44	1. =	3.2175	=	3.5279
2. =	30.888	2. =	5 :	8.88	2. =	6.4350	=	7.0558
3. =	46.332	3. =	7 :	43.32	3. =	9.6525	=	10.5837
4. =	61.776	4. =	10 :	17.76	4. =	12.8700	=	14.1116
5. =	77.220	5. =	12 :	52.20	5. =	16.0875	=	17.6395
6. =	92.664	6. =	15 :	26.64	6. =	19.3050	=	21.1674
7. =	108.108	7. =	18 :	1.08	7. =	22.5295	=	24.6953
8. =	123.552	8. =	20 :	35.52	8. =	25.7400	=	28.2232
9. =	138.996	9. =	23 :	9.96	9. =	28.9575	=	31.7511

The decimal progression of all the French weights and measures renders it only necessary to change the decimal point in order to convert one into the equivalent of any other of the same species, and numerically the same, but of a different denomination. Thus, as 9 litres are equal to 15.5817 ale pints, 9 hectolitres will be equal to 1558.17 ale pints; and so of the rest.

Table for the Conversion of Grammes and their Multiples into Poids-de-Marc, and the Metrical Pound. MM. Henry & Guibourt.

	Poids-de-Marc.				*Metrical Pound.*			
	℔	℥	ʒ	gr.	℔	℥	ʒ	gr.
1 centigr.	0	0	0	0.19	0	0	0	0.18
2	0	0	0	0.38	0	0	0	0.37
3	0	0	0	0.56	0	0	0	0.55
4	0	0	0	0.75	0	0	0	0.74
5	0	0	0	0.94	0	0	0	0.92
6	0	0	0	1.13	0	0	0	1.11
7	0	0	0	1.32	0	0	0	1.29
8	0	0	0	1.51	0	0	0	1.47
9	0	0	0	1.69	0	0	0	1.66
1 decigr.	0	0	0	1.88	0	0	0	1.84
2	0	0	0	3.77	0	0	0	3.69
3	0	0	0	5.65	0	0	0	5.53
4	0	0	0	7.53	0	0	0	7.37
5	0	0	0	9.41	0	0	0	9.21
6	0	0	0	11.30	0	0	0	11.06
7	0	0	0	13.18	0	0	0	12.90
8	0	0	0	15.06	0	0	0	14.74
9	0	0	0	16.94	0	0	0	16.59
1 gramme	0	0	0	18.83	0	0	0	18.43
2	0	0	0	37.65	0	0	0	36.86
3	0	0	0	56.48	0	0	0	55.29
4	0	0	1	3.31	0	0	1	1.72
5	0	0	1	22.14	0	0	1	20.15
6	0	0	1	40.96	0	0	1	38.58
7	0	0	1	59.79	0	0	1	57.01
8	0	0	2	6.62	0	0	2	3.44
9	0	0	2	25.44	0	0	2	21.89
1 decagr.	0	0	2	44.27	0	0	2	40.32
2	0	0	5	16.54	0	0	5	8.64
3	0	0	7	60.81	0	0	7	48.96
4	0	1	2	33.09	0	1	2	17.28
5	0	1	5	5.36	0	1	4	57.60
6	0	1	7	49.63	0	1	7	25.92
7	0	2	2	21.90	0	2	1	66.24
8	0	2	4	66.17	0	2	4	34.56
9	0	2	7	38.44	0	2	7	2.88
1 hectogr.	0	3	2	10.71	0	3	1	43.2
2	0	6	4	21.43	1	6	3	14.4
3	0	9	6	32.14	1	9	4	57.6
4	0	13	0	42.86	1	12	6	28.8
5	1	0	2	53.57	1	0	0	
6	1	3	4	64.29	1	3	1	43.2
7	1	6	7	3.	1	6	3	14.4
8	1	10	1	13.72	1	9	4	57.6
9	1	13	3	24.43	1	2	6	28.8
1 kilogr.	2	0	5	35.15	2	0	0	

Table for converting Grains, Drams and Ounces, Poids-de-Marc, into exact Grammes, and those of the Metrical Pound. MM. Henry and Guibourt *.

	Grammes exact.	*Metrical Pound.*
1 grain.	0.0531	0.054
2	0.1062	0.11
3	0.1593	0.16
4	0.2125	0.22
5	0.2656	0.27
6	0.3187	0.33
7	0.3718	0.38
8	0.4249	0.43
9	0.4780	0.49
10	0.5311	0.54
11	0.5842	0.60
12	0.6373	0.65
18	0.9560	0.98
24 or ℈j.	1.2747	1.30
36 or ʒſs.	1.9121	1.95
48 or ℈ij.	2.5494	2.6
1 dram.	3.8242	3.9
2	7.6485	7.8
3	11.4728	11.7
4	15.2971	15.6
5 dram.	19.1213	19.5
6	22.9456	23.4
7	26.7698	27.3
1 ounce.	30.5941	31.2
2	61.1882	62.5
3	91.7828	93.7
4	122.3765	125.
5	152.9706	156.
6	183.5647	187.5
7	214.1588	219.
8	244.7529	250.
9	275.3470	281.
10	305.9412	312.5
11	336.5353	344.
12	367.1294	375.
13	397.7235	406.
14	428.3176	437.5
15	458.9117	469.
1 pound.	489.5058	500.

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* Several decrees have rendered all the metrical measures obligatory in France; but notwithstanding the beauty and simplicity of the system, the public has continued to use the *Poids-de-Marc*; which may be ascribed to three causes: 1*st*, Habit; 2*d*, The interest of the merchant, who prefers the pound to the half kilogramme, which is a little heavier; 3*dly*, The division of the price of the pound is easier to calculate by the half, quarter, eighth, and sixteenth, than the division of the half kilogramme by five. Hence the Government was obliged to enter into a compromise, so to express it, with the metrical system, by taking as the unity of weight or pound the half kilogramme, and admitting not only its division by hectogrammes, but also its division into half pounds, quarter pounds, two ounces, ounce and drachm, like the old pound. The preceding tables shew the comparative value of the old pound *Poids-de-Marc*, and of the new metrical pound.

The new pound has been generally adopted, except by the apothecaries and goldsmiths, and without any good reason on their part. For medical purposes, it seems to be quite indifferent, in regard to substances prescribed by the pound weight, such as water, wine, alcohol, sugar, to use a pound of 500 grammes, instead of one of 489.5; for those of an ounce, such as distilled waters and syrups, an ounce of 31.25 gr., instead of one of 30.6; for those of a drachm, such as many powders and tinctures, a drachm of 3.9, instead of one of 3.8; and, lastly, for substances prescribed by grains, to use a grain of 0.054, instead of one of 0.053 gr. Besides, it is certain, that the prescription of one grain, one ounce, one pound, are not given because these doses are exactly and exclusively of all approaching quantities those proper for the patients, but because these quantities are complete unities, which simplify the prescriptions, and render them less liable to error in their execution. MM. Henry and Guibourt.

FOREIGN WEIGHTS OF OTHER COUNTRIES.

It would be out of place here to notice all the varieties of weights and measures used in other countries, which also differ for different commodities. In general, the apothecaries weight differs from that in common use, and is differently divided; but in writings, which treat expressly of weights and measures, the apothecaries weight is not often specified. In many places of Germany, the apothecaries pound is two-thirds of that in common use, and contains 12 ounces of the same weight, of which the civil weight contains 16.

Most commonly the apothecaries weight is divided in the same manner as our troy weight, or the ounce contains 480, the dram 60, and the scruple 20, of the respective grains of the country; but in other cases, the ounce contains 576, the dram 72, and the scruple 24 grains, as in the French Poids de Marc. This division is used in Spain, Portugal, and some states of Italy and Switzerland, as well as in France. This is to be attended to, because the proportions between the grains and the ounce, drachm, and scruple differ, which, on some occasions, leads to chemical errors. Thus, Coindet's Tincture of Iodine, for which he orders 48 grains to be dissolved in an ounce of rectified spirit, can be prepared according to the *Poids de Marc*, but not according to troy weight; the iodine amounting to $\frac{1}{12}$ of the spirit in the one case which is dissolved, and $\frac{1}{10}$ in the other, which is a larger proportion than the spirit can dissolve.

NUREMBERG OR GERMAN APOTHECARIES WEIGHT.

Pound.	*Ounces.*	*Drachms.*	*Scruples.*	*Grains.*	*Troy grs.*	*Grammes.*
1 =	12 =	96 =	288 =	5760 =	5388 =	357664
	1 =	8 =	24 =	480 =	460.5 =	29805
		1 =	3 =	60 =	57.5 =	3725
			1 =	20 =	19.2 =	1242
				1 =	0.96 =	62

Table of some Foreign Apothecaries weight in Milligrammes, from Meissner, Nelkenbrecher and Otto.

	Pound.	*Ounce.*	*Drachm.*	*Scruple.*	*Grain.*
Amsterdam wholesale,	470401.0				
——— retail, ...	369003.3	30750.27	3843.78	1281.26	64.06
Austrian, ...	402009.0	35000.75	4375.09	1458.36	72.92
English, ...	373135.	31094.61	3886.83	1295.61	64.28
Paris, ...	367129.4	30594.1	3824.2	1274.7	50.31
Bavarian since 1811,..	360000.	30000.	3750.	1250.	62.5
——— before 1811,	357712.5				
German, Prussian, Russian, Danish,	357663.9	29805.32	3725.66	1241.88	62.09
Swedish, ...	356318.7	29693.23	3711.65	1237.22	61.86
Spanish, ...	345027.6	28752.30	3594.04	1198,01	59.90
Venetian, ...	302025.3	25168.77	3146.09	1048.69	52.43
Turin, ...	307514.				
Berne, ...	356658.				
Florence, ...	339515.				
Turkey, (Oka of 400 druna,)............	1275656.				

DIVISION OF COLOGNE CIVIL WEIGHT.

Marc.	*Oz.*	*Loth.*	*Drs.*	*Pwts.*	*Hellers.*	*As.*	*Eschen.*	*Grs.*	*St. parts.*
1 =	8 =	16 =	64 =	256 =	512 =	1792 =	4352 =	6144 =	65536
	1 =	2 =	8 =	32 =	64 =	224 =	544 =	768 =	8192
		1 =	4 =	16 =	32 =	112 =	272 =	384 =	4096
			1 =	4 =	8 =	28 =	68 =	96 =	1024
				1 =	2 =	7 =	17 =	24 =	256

Number of Marcs or Pounds in common use, which are equivalent to 100 *lbs. British (Nelkenbrecher and Otto.)*

	Avoirdupois.	*Imperial Troy.*
Berlin marc,		159.589
Cologne marc,		159.555
Vienna poids de marc,		132.952
Paris,		131.268
Swedish iron marc,	133.356	109.720
Breslau pound,	111.920	92.082
Petersburgh,	110.890	91.234
Dantzic,	104.160	85.698
Leipsig,	97.197	79.823
Frankfort, light,	96.931	79.751
Berlin,	96.785	
Hamburgh,	93.640	77.043
Augsburgh,	92.358	75.988
Amsterdam,	91.819	75.544
Copenhagen,	90.082	74.727
Frankfort, heavy,	89.754	73.845
Nuremberg,	88.869	73.117
Vienna,	80.981	

Table shewing the Comparison between Grammes and Troy, French, and Nuremberg, Apothecary Grains.

Gramme.		*Troy.*		*Poids de Marc.*		*Nuremberg.*
1	=	15.444	=	18.883	=	16.128
2	=	30.888	=	37.766	=	32.256
3	=	46.332	=	56.648	=	48.384
4	=	61.776	=	75.530	=	64.512
5	=	77.220	=	94.413	=	80.641
6	=	92.664	=	113.296	=	96.769
7	=	108.108	=	132.179	=	112.897
8	=	123.552	=	151.062	=	129.026
9	=	138.996	=	169.944	=	145.154
10	=	154.440	=	188.827	=	161.282

Swedish Weights and Measures, used by Bergman and Scheele.

The Swedish pound, which is divided like the English Apothecary, or troy pound, weighs 6556 grains troy.

The kanne of pure water, according to Bergman, weighs 42250 Swedish grains, and occupies 100 Swedish cubical inches. Hence the kanne of pure water weighs 48083.72 English troy grains, or is equal to 189.9413 English cubic inches; and the Swedish longitudinal inch is equal to 1.24 English longitudinal inches.

Table of the Weights used by the Native Druggists in the Lower Hindoostan, (Dr Ainslie.)

Grains of Paddy, Rice dried in the husk.

16 =	1 *Gold Fanam.*						
168 =	10½ =	1 *Star Pagoda.*					
1680 =	105 =	10 =	1 *Pollam.*				
42000 =	2575 =	250 =	25 =	1 *Seer.*			
64320 =	4020 =	400 =	40 =	1⅗ =	1 *Viss.*		
514560 =	32160 =	3200 =	320 =	12⅕ =	8 =	1 *Maund.*	
10291200 =	64320 =	64000 =	6400 =	244 =	160 =	20 =	1 *Parum.*

Two grains and a half of dried paddy are reckoned equal to one grain of troy weight; 5 grains troy to one gold fanam; and a star pagoda to 2 scruples and 22 grains troy. A parum or candy weighs 500 lb. avoirdupois.

ANCIENT ROMAN LIQUID MEASURE *.

Congius.	*Sextarius.*	*Hemina.*	*Acetabulum.*	*Cyathus.*	*Uncia.*	*Ligula or Cochleare.*	*Denarius.*	*Sextans or Obolus.*	*Chalcoi.*
1 =	16 =	12 =	48 =	72 =	96 =	288 =	720 =	4320 =	43200
	1 =	2 =	8 =	12 =	16 =	48 =	120 =	720 =	7200
		1 =	4 =	6 =	8 =	24 =	60 =	360 =	3600
			1 =	1½ =	2 =	6 =	15 =	90 =	900
				1 =	1⅓ =	4 =	10 =	60 =	600
					1 =	3 =	7 =	42 =	420
						1 =	2½ =	15 =	150
							1 =	6 =	60
								1 =	10

The sextarius is 36.94 English cubic inches; the urna contains 4, the amphora 8, and the dolium 160 congii.

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* In the following tables much assistance has been derived from Mr Kelly's excellent work.

ANCIENT ROMAN WEIGHTS.

Siliquæ.
3= 1 *Simplium.*
6= 2= 1 *Scrupulum.*
18= 6= 3 =1 *Denarius of Nero.*
21= 7= 3½=1⅙= 1 *Denarius of Papyrius.*
24= 8= 4 =1⅓= 1⅙ =1 *Sextula.*
36= 12= 6 =2 = 1¾ =1½= 1 *Sicilicum.*
48= 16= 8 =2⅔= 2⅓ =2 = 1⅓= 1 *Duella.*
144= 48= 24 =8 = 7 =6 = 4 = 3= 1 *Uncia.*
1728=576=288 =96=84 =72= 48 = 36= 12 = 1 *Libra.*

Authors differ as to the comparison of these ancient and modern weights. The following numbers are troy grains:

	Den. Nero.	*Den. of Pap.*	*Uncia.*	*Libra.*
Arbuthnott,	-	62.4	437.2	5246.4
Christiani,	51.9		415.1	4981.2
Paucton, -	53.9	61.6	431.2	5174.4

ANCIENT GREEK LIQUID MEASURES.

Keramion or Metretes.	*Amphoreus.*	*Chous.*	*Xestes.*	*Cotylus.*	*Oxybathon.*	*Cyathus.*	*Concha.*	*Mystrum.*	*Chema.*	*Cochleare.*
1	2	12	72	144	576	864	1728	3456	4320	8640
	1	6	36	72	288	432	864	1728	2160	4320
		1	6	12	48	72	144	288	360	720
			1	2	8	12	24	48	60	120
				1	4	6	12	24	30	60
					1	1½	3	6	7½	15
						1	2	4	5	10
							1	2	2½	5
								1	1¼	2½
									1	2

The keramion is equal to 35 French pints, or 8⅔ apothecaries gallons.

ANCIENT GREEK WEIGHTS.

Gold Talent.	*Attic Talent.*	*Attic Mina.*	*Gold Statera.*	*Didrachm.*	*Drachm.*	*Obolus.*	*Chalcoi.*
1	10	600	3000	30,000	60,000	360,000	2,160,000
	1	60	300	3000	6000	36,000	216,000
		1	5	50	100	600	3600
			1	10	20	120	720
				1	2	12	72
					1	6	36
						1	6

GREEK MEDICINAL WEIGHTS.

Mina.	*Littra.*	*Uncia.*	*Drachma.*	*Scrupulus.*	*Obolus.*	*Lupinus.*	*Siliqua.*	*Æreoli.*
1 =	1½ =	16 =	128 =	384 =	768 =	1152 =	2304 =	6144
	1 =	12 =	96 =	288 =	576 =	864 =	1728 =	4680
		1 =	8 =	24 =	48 =	72 =	144 =	384
			1 =	3 =	6 =	9 =	18 =	48
				1 =	2 =	3 =	6 =	16
					1 =	1½=	3 =	8
						1 =	2 =	5⅓
							1 =	2⅔

There was also a smaller mina, containing 75 drachms. Authors differ as to the comparison between the ancient Greek and modern weights. The following numbers are troy grains:

	Attic Drachm.	*Attic Mina.*	*Smaller Mina.*	*Medicinal Mina.*
Arbuthnott,	54.6	54.64		6994
Christiani,	51.9	51.89	3892	
Paucton,	69.	69.00		

JEWISH WEIGHTS.

Shekels.		*Maneh.*		*Talent.*		*Troy Weight.*			
						lb.	*oz.*	*dwt.*	*gr.*
60	=	1							
300	=	50	=	1	=	113	10	1	10

EGYPTIAN WEIGHTS.

Drachm.		*Mina.*		*Talent.*		*Troy Weight.*		
100	=	1				*lb.*	*oz.*	*dwt.*
600	=	60	=	1	=	86	8	16

The mina was also divided into 16 ounces; and another pound, littra or ratel, was divided into 12; which may have been the origin of the two divisions of the European pound.

FORTUITOUS OR APPROXIMATIVE MEASUREMENT.

"There are many substances in daily use," say the editors of the last Parisian Pharmacopœia, "which we are accustomed to prescribe, not by weight, but by number, or by measures of various kinds, or by other means. But, in this way, their relative proportions to other substances are not known with sufficient accuracy, and there may be danger with medicines of considerable power and variable density, since often the same measure by no means corresponds with equal weights. We have therefore subjoined their true value, derived from experiments, so that their quantity may be easily and certainly compared with others of like nature."

"Liquids, which are prescribed by drops, especially if they be very volatile, as alcohol, ether, &c. were measured by the following contrivance, lest any error arise from their being easily dissipated. We filled with the liquid a phial having a narrow neck, and a flat lip *(ostiolus)* turned outwards. The weight of the phial and fluid together was then accurately ascertained, and, by inclining the phial, the liquor was allowed to drop slowly from the mouth, and the drops numbered; and, lastly, the phial, with the remaining liquor, was weighed. By dividing the loss of weight by the number of the drops, the weight of each drop was obtained. We have drawn up the following table in this way, in which is shewn the weight of twenty drops of each."

"But as the weight of the drops depends upon their size, it arises much less from the specific gravity of the liquid, than from the cohesion and viscidity of its particles."

Of the following liquids

Twenty drops weigh	*Fr. grains.*	*grammes.*
Æther sulphuricus, sp. gr. 0.715, ...	7	0.35
Æther sulph. alcoolisatus, or Liq. min. anod. H. Alcool purissimus, sp. gr. 0.847, ... Alcoolatum melissæ compositum, ...	9	0.45
Alcool potassa saturus, ... Oleum animale Dipelii, ... Tinctura benzoini alcoolica, ... Tinctura castorei alcoolica, ...	10	0.50
Oleum olivarum, ... Oleum amygdalinum, ...	11	0.55
Acidum aceticum densissimum, sp. gr. 1075, ...	12	0.60
Acidum aceticum commune, or Acetum stillat. Oleum menthæ volatile, ...	13	0.65
Oleum de petroleo volatile, or Naphtha, ... Acidum sulphuricum alcoolisatum, ... Aquæ simplices stillatitiæ, ...	14	0.70
Laudanum liquidum Sydenhami, ...	15	0.75
Oleum volatile de caryophyllis aromaticis, ...	16	0.80
Soda caustica liquida, sp. gr. 1321, ... Aqua soluto magnesiæ sulphate satura, ...	18	0.90
Laudanum of Abbé Rousseau, ...	22	1.10
Acidum hydrocyanicum, sp. gr. 900, ...	23	1.15
Acidum sulphuricum, sp. gr. 1847, ... Gummi Arabicum aqua solutum ad $\frac{1}{3}$ totius, ...	24	1.20
Syrupus de saccharo, sp. gr. 1321, ...	30	1.50

The practice of administering active fluids by drops has been long known to be inaccurate; but the extent of the evil was first ascertained by the accurate experiments of Mr Shuttleworth, surgeon, of Liverpool. Not only do the drops of different fluids from the same vessel, and of the same fluids from different vessels, differ much in size; but it appears that the drops of the same fluid differ, even to the extent of a third, from different parts of the lip of the same vessel. The custom of dropping active fluids should, therefore, be abolished entirely; and, as weighing is too troublesome and difficult for general use, we must have recourse to small measures accurately graduated, in the manner of Lane's *drop* measure, and the *grain* measure, recommended by the Edinburgh college; but we must not be misled by their names; for they are measures of bulk, not of drops or of grains.

In the following table, the first column shews the weight, the second the number of drops, and the third the weight, of the extract, in a measured drachm of several active fluids, in circumstances as nearly similar as possible, as ascertained by Mr Shuttleworth; the last column shews the number of drops in a drachm of different fluids, according to Dr Niemann in the Pharmacopœia Batava:

	Grains.	*Drops.*	*Grains.*	*Drops.*
Distilled water,	60	60		60–80
Solution of arsenic,	60¾	60		
White wine,	58¾	94		
Ipecacuanha wine,	59¾	84	2½	
Antimonial wine,	59¾	84		
Rectified spirits of wine,	51½	151½		
Proof spirit,	54¼	140		
Laudanum,	55½	134	2¾	90–110
Tincture of foxglove,	58	144		
Balsam of copaiva,				60–70
Spring water,				60–70
Diluted mineral acid,				60–80
Water of ammonia,				100–120
Spirit of sulphuric ether,				120–140
Tinctures,				140–180
Ether,				140–180

Larger quantities are measured by spoons, drinking glasses, and cups.

A tea-cup, commonly contains three or four ounces of an infusion, decoction, or mixture.

A wine-glass, about an ounce and a half.

A table-spoon, about half an ounce of watery fluids, and two or three drachms of alcoholic.

A tea-spoon, from half a scruple to a scruple of a light powder, such as magnesia, from half a drachm to two scruples of a heavier powder, as sulphur, and from one drachm to four scruples of a metallic oxide: from one scruple to half a drachm of alcoholic fluids; from half a drachm to two scruples of watery fluids; from two scruples to two drachms of tinctures and syrups, and from one to two drachms of electuaries. But all this is very uncertain.

The Paris Pharmacopœia makes the following estimations:—

		Grammes.
A wine glass contains more than 5 ounces	=	160
A table-spoon more than 5 drachms	=	22
A tea-spoon about $\frac{5}{4}$ of a drachm, or		5

Herbs and simples were estimated by the quantity that could be lifted or carried with convenience.

Manipulus, a handful which could be taken up in the hand, was generally reckoned equal to

Pugillus, a pinch, which could be lifted between the thumb and two first fingers.

Fasciculus, a bundle which could be carried under the arms.

The following table is from the Paris Pharmacopœia:

	Grammes.		*Oz.*	*Dr.*	*Scr.*	*Gr.*
Manipulus seminum hordei	101.40	or	3	2½	0	0
———— lini	47.60		1½	0	0	0
———— farinæ de semine lini	105.00		3	2	0	0
———— foliorum malvæ siccorum	43.90		1	3	0	0
———— cichorei siccorum	30.60		1	0	0	0
———— florum tiliæ	40.10		1	2½	0	0
Pugillus florum anthemidis nobilis	7.80		0	2	0	0
———— arnicæ montanæ	6.20		0	1	2	0
———— tussilaginis farfaræ	6.20		0	1	2	0
———— althææ officinalis	5.00		0	1	1	0
———— malvæ	3.20		0	0	0	60
———— seminum anethi feniculi	7.00		0	1	0	60
———— pimpinellæ anisi	4.40		0	1	½	0

Other weights noticed in the Paris Pharmacopœia;

A fresh egg of large size,—

	oz.	*dr.*	*gr.*		*gram.*	
The whole weighs	2	2	0	=	68	8
Without the shell	2	0	0	=	61	2
The white weighs	1	2	57	=	41	3
The yoke	0	5	15	=	19	9

Two ounces of almonds (without their shells,) contain 53 almonds.

	gr.		*gram.*	
Each weighs about	23	=	1	15
When stripped of their pellicle	20	=	1	

TABLES OF SPECIFIC GRAVITY.

Inflammables, &c.

Sulphur roll,		1.9907
———— native,	1.065	to 2.033
Phosphorus,	1.821	to 1.714
Diamond,	3.5212	to 3.658
Charcoal *,	0.280	to 0.440
Iodine,		4.948
Pit coal,	1.232	to 1.420
Graphite,	1.000	to 1.245
Asphaltum,	1.450	to 2.060

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* This applies only to charcoal in mass. In reality it is much heavier than water.

Metals.

Platinum, hammered,	21.314	Brass,	8.006
Gold, hammered,	19.361	Zinc, hammered,	7.861
Quicksilver, frozen,	15.612	Steel,	7.833
———— distilled,	13.545	Tin, hammered,	7.799
Lead,	11.362	Soft iron,	7.788
Silver, hammered,	10.622	Antimony,	6.702
Bismuth,	9.832	Barium,	4.
Copper, hammered,	9.000	Potassium,	0.972
Cadmium,	8.694	Sodium,	0.865
Arsenic,	8.308		

Saline Solids.

		Newton	Muschenbroek.	Kirwan.	Hassenfratz.
Potassa,				4.6215	1.7085
——— carbonated,			2.749		2.0120
——— sulphated,			2.398	2.636	2.4073
——— nitrated,		1.900	1.901	1.933	1.9369
——— tartrated,					1.5567
——— supertartrate,			1.8745		1.9153
Soda,					1.336
—— carbonated,				1.421	1.3591
—— sulphated,					1.4457
—— muriated,		2.143	2.0835		2.2001
—— phosphated,					1.333
—— subborate,		1.714	1.7170		1.723
—— acetate,					2.109
—— tartrate					1.7437
Ammonia carbonated,			1.5026	1.8245	0.9660
Salt of hartshorn,	1.496				
Sal ammoniac,	1.42 to 1.453				
Baryta,				4.000	2.3740
——— sulphated,	4.4 to 4.5				
——— muriated,					2.8257
Witherite, (carbonate),	4.3 to 4.338				
Strontia,					1.647
Strontianite,	3.6 to 3.9				
Lime,			2.3700	2.3908	1.5233
—— muriated,					1.7003
Chalk,	2.315 to 2.657				
Limestone,	2.6 to 2.7				
Marble,	2.515 to 2.857				
Spar,	2.693 to 2.718				
Gypsum, (sulphate),	2.274 to 2.322				
Anhydrite,	2.85 to 2.964				
Apatite (phosphate),	3.1				

		Newton	Muschenbroek.	Kirwan.	Hassenfratz.
Magnesia,				2.3298	0.3460
———— native,	2.13				
———— carbonated,					0.2940
———— sulphated,					1.6603
Alumina,				2.000	0.8200
—— sulphate,		1.714	1.726		1.7109
—— subsulphate, native,	1.669				
Alum,	1.714 to 1.85				
Zinc, sulphated,		1.912	1.900		1.9120
White vitriol,	1.912				
Iron, sulphated,			1.88		1.8399
—— acetated,					1.398
Dantzic copperas,	1.715				
English ditto,	1.839 to 1.880				
Copper, sulphated,				2.23	2.1943
Blue vitriol,	2.194 to 2.23				
Lead, acetated,	2.395 to 2.745		2.3953		2.3450
Mercury, muriate,					5.1398
———— submuriate,					7.1758
Tartar emetic,	2.246				

Vegetable Substances.

Gum Arabic,	1.4523
—— tragacanth,	1.3161
—— cherry,	1.4817
Asafœtida,	1.3275
Ammoniac, gum,	1.2071
Scammony, Smyrna,	1.2743
———— Aleppo,	1.2354
Galbanum,	1.2120
Sagapenum,	1.2008
Opoponax,	1.6226
Bdellium,	1.3717
Myrrh,	1.3600
Ivy gum,	1.2948
Gamboge,	1.2216
Euphorbium,	1.1244
Olibanum,	1.1732
Sarcocoll,	1.2654
Guaiac,	1.2289
Jalap resin,	1.2185
Benzoin,	1.0924
Sandarac,	1.0920
Common yellow or white rosin,	1.0727
Arcanson,	1.0857
Galipot,	1.0819
Baras,	1.0441
Frankincense,	1.173

Storax,	1.1098
Pitch,	1.15
Copal, opaque,	1.1398
——— transparent,	1.0452
——— Madagascar,	1.0600
——— Chinese,	1.0628
Elemi,	1.0182
Anime, oriental,	1.0284
——— occidental,	1.0426
Labdanum,	1.1862
Dragon's blood,	1.2045
Gum lac,	1.139
Tacamahac,	1.0463
Alouchi (Drymis Winteri,)	1.1064
Caragna,	1.1244
Acajou gum,	1.4456
Bassora gum,	1.4346
Monbaris gum,	1.4206
Aloes, socotorine,	1.3795
—— hepatic,	1.3586
Extract of liquorice,	1.7228
——— acacia,	1.5153
——— areca,	1.4573
Catechu (mimosa,)	1.3980
Extract of St John's wort,	1.5263
Mastiche,	1.0742
Caoutchouc,	0.9335
Camphor,	0.9887
Indigo,	0.7690
Arnotto,	0.5956
Amber,	1.078
Sugar, white,	1.616
Opium,	1.3366
Guaiac wood,	1.3330
Cork,	0.2400
Oak wood,	1.1700
Fir,	0.498 to 0.5500
Sanders wood, yellow,	0.809
——— red,	1.128
——— white,	1.041
Peruvian bark,	0.784
Sassafras wood,	0.482
Campeachy wood,	0.913
Brazil wood, red,	1.031
Lignum vitæ,	1.327
Barley,	1.279
Rye,	1.320
Wheat,	1.346
Acorn, dry,	0.755

Animal Substances.

Ambergris,	0.780 to 0.926
Wax, yellow,	0.965
—— white,	0.968
Ouarachi wax,	0.897
Spermaceti,	0.943
Beef fat,	0.9232
Veal fat,	0.9342
Mutton fat,	0.9235
Hog's fat,	0.9368
Pearl,	2.750
Coral,	2.690
Crab's eyes,	1.89
Ivory,	1.825 to 1.917
Human body,	1.111
Mutton suet,	0.9235
Butter,	0.9423
Tallow,	0.9419
Hog's lard,	0.9423 to 0.9568
Urea, crystallized, (Prout),	1.35
Human body, (Muschenbroek,)	1.111

Saline fluids.

Sulphuric acid, purest of commerce, Dr Ure,	1.8452
———— concentrated, (1.930 Meissner),	1.842
———— real,	2.1250
Sulphurous acid, liquid, Bussy,	1.45
Nitrous acid, fuming, (1.03 Meissner),	1.625
Nitric acid, (1.43 Meissner),	1.5800
Muriatic acid, fuming,	1.205
Muriatic acid,	1.1940
Acetic acid, concentrated,	1.0626
Vinegar, white,	1.014
———— red,	1.025
———— distilled,	1.005
Carbonic acid, saturated solution,	1.0015
Ammonia, saturated solution,	0.8070
Hydrocyanic acid, (0.883 Meissner,)	0.7050

Solutions of Salts at 42° Fahrenheit. Bishop Watson.

	Saturated.	*In 12 waters.*
Lime,	1.001	
Arsenious acid,	1.005	
Borax,	1.010	
Oxalate of ammonia, (Thomson,)	1.0186	
Alum,	1.033	

	Saturated.	*In 12 waters.*
Sulphate of soda,	1.052	1.029
Sulphate of potass,	1.054	
Muriate of ammonia,	1.072	1.026
Carbonate of ditto,	1.077	
Nitrate of potass,	1.095	1.050
Tartrate of potass and soda,	1.114	
Arseniate of potass,	1.184	
Muriate of soda,	1.198	1.059
Sulphate of copper,	1.150	1.052
——— iron,	1.157	1.043
——— magnesia,	1.218	
——— zinc,	1.386	1.045
Subcarbonate of potass,	1.534	

Fluids of various kinds.

Water,	1.000
Ice, (Muschenbroek 0.918,) Meineke,	0.815
Sea water,	1.0263
Water from the Dead Sea,	1.2403
Alcohol, (Meissner 0.7930,)	0.8293
Brandy,	0.8371
Malaga wine,	1.022
Tokay wine,	1.054
Madeira wine,	1.0382
Hock,	0.999
Burgundy,	0.991
Claret,	0.992
Champagne,	0.962
Moselle,	0.916
Sulphuric ether, (0.710 Meissner, 0.632 Lovitz,)	0.7396
Nitric ether,	0.9088
Muriatic ether, (Meissner,)	0.7296
Acetic ether, (.915 Meissner,)	0.8664
Mineral naphtha,	0.708
Turpentine, liquid,	0.991
Balsam of copaiva,	0.886
Volatile oil of Amber,	0.886
——— Orange flowers,	0.880
——— Coriander,	0.865
——— Roman chamomile,	0.894
——— Balm,	0.881
——— Hyssop,	0.889 to 0.968
——— Sage,	0.901
——— Cummin,	0.905
——— Wormwood,	0.907
——— Dill seed,	0.913 to 0.994
——— Juniper berries,	0.858

Volatile oil of Turpentine,		0.867 to 0.8697
———— Lavender,		0.8938
———— Mint,		0.898 to 0.975
———— Thyme,		0.902
———— Rosemary,		0.906
———— Peppermint,		0.920
———— Fennel leaves,		0.929
———— Tansy,		0.933
———— Scurvy grass,		0.943
———— Star anise,		0.982
———— Anise,		0.987
———— Cloves,		1.0363
———— Cinnamon,		1.0439
———— Fennelseed,		1.098
———— Sassafras, *(Laurus Sassafras,)*		1.078 to 1.094
Azeite de sassafras, native oil of laurel, (tree unknown)	Duncan,	0.871
Fluid camphor of Borneo,	Duncan,	0.887
Fixed oil of Linseed,		0.9403
———— Poppy,		0.9288
———— Almond,		0.9170
———— Olive,		0.9153
———— Walnut,		0.923
———— Hazle nut,		0.916
———— Hemp seed,		0.926
Cows butter,		0.8916
Poppy seed,		0.9288
Beech mast,		0.9176
Train oil,		0.9235
Cows milk,		1.0324
Asses milk,		1.0355
Human milk,		1.0203
Mares milk,		1.0346
Goats milk,		1.0341
Ewe milk,		1.0409
Cows whey,		1.0193
Blood (human), Prout,		1.03 to 1.055
Human serum, (Marcet),		1.028 to 1.0295
Crassamentum,		1.126
Human urine, (Prout),		1.0106 to 1.015
Albuminous urine,	Prout,	1.0041 to 1.019
High coloured urine,		1.025 to 1.030
Urine with excess of urea,		1.015 to 1.030
Saccharine urine,		1.020 to 1.050
Urine depositing phosphates,		1.006 to 1.012
Honey,		1.450

Gases and Vapours chiefly according to Dr Thomson.

	Air = 1.000.	Water at 30°=1.000.	100 C. I. weigh grs.
Hydrogen gas, (Prout,)	0.0694		2.118
Carbon vapour,	0.4166		
Arseniated hydrogen,	0.5290		
Carburetted hydrogen,	0.5555		
Ammonia,	0.5903		18.0035
Steam,	0.6250		19.0620
Subphosphuretted hydrogen,	0.6944		
Phosphorous vapour,	0.8333		
Phosphuretted hydrogen,	0.9027		
Hydrocyanic acid,	0.9375		
Prussic acid,	0.9476		
Bihydroguret of phosphorus,	0.9722		
Azotic gas,	0.9722		29.6527
Carbonic oxide,	0.9722		
Olefiant gas, (Henry,)	0.9760		
Atmospheric air,	1.0000	0.00130	30.500
Nitric oxide,	1.0417		
Oxygen, (Prout,)	1.1111		33.915
Sulphur vapour,	1.1111		
Sulphuretted hydrogen,	1.1805		
Muriatic acid,	1.2847		
Carbonic acid,	1.5277		46.5972
Nitrous gas,	1.5277		
Alcohol vapour, (Gay Lussac,)	1.6133		
Cyanogen,	1.8055		
Muriatic ether vapour, (Thenard,)	2.2190		
Tellurium vapour,	2.2222		
Sulphurous acid,	2.2222		
Telluretted hydrogen,	2.2916		
Fluoboric acid,	2.3611		
Protoxide of chlorine,	2.4444		
Chlorine,	2.5000		76.25
Sulphuric ether vapour, (Gay Lussac,)	2.5860		
Arsenic vapour,	2.6388		
Bisulphuret of carbon,	2.6388		
Arseniated hydrogen,	2.7083		
Sulphuric acid vapour,	2.7777		
Selenium vapour,	2.7777		
Seleniuretted hydrogen,	2.8522		
Naphtha vapour,	2.9166		
Nitrous acid,	3.1812		
Chloric ether vapour, (Gay Lussac,)	3.4434		
Chlorocarbonic acid,	3.4722		
Fluosilicic acid vapour,	3.6111		
Nitric acid vapour,	3.7500		
Hydriodic acid,	4.4340		
Oil of turpentine vapour, (Robiquet,)	5.0150		
Hydriodic ether vapour, (G. L.)	5.4749		
Iodine vapour,	8.6111		

Table of Specific Gravities indicated in the different British Pharmacopœias.

	Dub. 1827 *.	*Lond.*	*Edin.*
Sulphuric ether,	765		
Alcohol,	810		
Rectified Spirit *(alcohol fortius,)*	840	835	835
Spirit of nitrous ether,	850		
Nitrous ether,	900		
Proof spirit, *(alcohol dilutius,)*	919	930	935
Solution of ammonia,	950	960	
Prussic acid,	998		
Oxymuriatic acid, *Dub.* 1807,	1003		
Distilled vinegar,	1005		
Tincture of muriate of iron (red,) *Dub.* 1807,	1050		
Acetic acid,	1074		
Solution of oxymuriate of potass, *Dub.* 1807,	1087		
——— carbonate of ammonia,	1090		
——— potass,	1080	1050	
——— sulphuret of potass,	1117		
Water of muriate of lime,	1202		
Solution of carbonate of soda saturated,	1224		
Water of muriate of barytes,	1230		
——— carbonate of potass,	1320		
Muriatic acid,	1160	1160	1170
——— diluted,	1080		
Nitrous acid,	1490	1500	1520
——— diluted,	1280		
Sulphuric acid, commercial,	1850	1850	1845
——— purified,	1845		
——— diluted,	1084		

Percentage Hydrometers.

Many attempts have been made to divide the scales of hydrometers so as to indicate the *percentage* of the more active or valuable substance in its various states of dilution with water; such as of absolute alcohol, ether, acid, alkali or salt. It is obvious that each substance will require a differently graduated hydrometer, according to the peculiarities of the substance mixed with the water; and we must have one hydrometer for alcohol and another for ether, one for sulphuric and another for nitric acid. Besides, there are many other difficulties which attend attempts of this kind, of which a stronger proof cannot be given than the following comparisons from Meissner's profound treatise on the subject of Areometry.

The specific gravity of 0.920 corresponds with

$13\frac{5}{7}$ degree of Baumé's Areometer, according to Gerstner's computation.
$21\frac{2}{7}$ ——————— according to Gilpin's computation.

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* When the specific gravity is indicated, it is understood to be taken at 60° Fahr. *Dub.*

$14\frac{4}{5}$ degree of Bentley's Areometer.
$12\frac{1}{2}$ ——— of the Dutch Areometer of 1805.
$13\frac{3}{5}$ ——— of the Dutch Areometer of 1792.
48 ——— of Lowitz's Alcoholmeter.
48 ——— of Richter's Alcoholmeter.
$48\frac{1}{2}$ ——— of scale A of Meissner's Alcoholmeter.
$54\frac{6}{10}$ ——— of scale B of the same.
$48\frac{5}{6}$ ——— of scale A of Meissner's most improved Alcoholmeter of 1815.
$54\frac{7}{10}$ ——— of scale B of the same.
56 ——— of Trales's Alcoholmeter.
$57\frac{1}{2}$ ——— of the Alcoholmeter for the Austrian Pharmacopœia 1812.
$62\frac{1}{4}$ ——— of the Œconomical Alcoholmeter of 1812.

Also supposing that we are told that a fluid corresponds with the 65 of the areometer, we find that this corresponds with different sp. gr. according to different observers. It is reckoned by

Gerstner,	1.698
Gilpin,	1.8245
Bentley,	1.819
Dutch Areom.	1.823

In such discrepancy, it becomes necessary to ascertain the place of residence of the author, and the kind of areometer he has used.

In the chemical works in the neighbourhood of Glasgow and Paisley, an Areometer, a percentage hydrometer, called Twaddel's Hydrometer, is used, which is very convenient on account of the facility with which the sp. gr. of the liquid tried by it is ascertained. As the scale requires to be extensive, in order to be adapted for general use, several instruments bearing different parts of the scale are sold together, accompanied by the following instructions:

"In Twaddel's Hydrometer every degree rises .005 decimal parts of a thousand, No. 0. in hydrometer No. 1. being unity, to which point the instrument will sink in distilled water at 56° of Fahrenheit's thermometer.

"To find the sp. gr. of any fluid, multiply the point it stands at by 5; if it be immersed in a fluid in which it stands 170° in hydrometer No. 6, then multiply by 5.

$$\begin{array}{r} 170 \\ 5 \\ \hline 1.850 \end{array}$$

"The integer 1. being added as above, shews the real sp. gr. compared to water, it being 1000, the fluid which points to 170 is as 1850 to 1000, and so on."

Table shewing the Weight in Grains of various Measures of Fluids of different Specific Gravities.

	Sp. Gr.	*Oct.*	*Floz.*	*Fldr.*	♏
Distilled water,	1000	7305	456.5	57	0.9
Sulphuric ether,	765	5575	333	41.5	0.65
Alcohol,	815	5950	372.5	45.5	0.73
Rectified spirit,	835	6100	380	47.5	0.75
Oil of Turpentine,	868	6340	396	49.5	0.78
Proof spirit,	935	6825	425	53.2	0.84
Solution of ammonia,	936				
Solution of ammonia,	960	7000	437.5	54.5	0.86
Muriatic acid,	1170	8600	535	63.2	1.05
Syrup,	1321	9643	603	75.3	1.25
Nitrous acid,	1500	10957	684	85.5	1.35
Sulphuric acid,	1845	13477	840	105.	1.65

Table of the Specific Gravities indicated in the French Pharmacopœia, also according to the Batavian and Baumé's Areometrical Scales.

The French generally express the specific gravities of bodies according to the scale of Baumé, which had the singular inconvenience of assuming distilled water as the *zero* of the descending scale, in relation to all fluids heavier than itself, and of assuming it as 10 in the ascending scale, in relation to all fluids lighter than itself. But the Batavian, and afterwards the French College consider it as an improvement to assume distilled water as the zero both of the ascending and descending series of numbers. The specific gravities indicated in the French Pharmacopœia are adapted to the height of mercury in the barometer, being a centimeter, and the temperature in general of 14° Reaum. or 17.5° Cent. 63.5° Fahr., except in regard to the very volatile fluids, when it is estimated at 0° = 32° Fahr.

Baumé.	Batavian	Sp. Gr.	*Fluids lighter than water.*
		700	Acidum hydrocyanicum purum, *(violent poison,) Gay-Lussac.*
66	56	715	Ether sulphuricus purissimus.
60	50	742	Idem bonæ notæ.
50	40	782	
48	38	792	Æther sulphuricus alcoholisatus, consisting of equal parts of alcohol and æther.
42	32	819	Alcohol purissimus, for pharmaceutical purposes.
40	30	827	
36	26	847	Alcohol purus, naphtha,
33	23	863	Alcohol venalis, ($\frac{3}{6}$.)
32	22	868	Oleum terebinthinæ volatile.
30	20	878	
26	16	900	Acidumhydrocyanicum of Scheele; also the acidum hydrocyanicum purum of Robiquet, mixed with an equal quantity of water.
25	15	906	Æther aceticus.
23	13	915	
23	13	915	Æther nitricus. ——— muriaticus. Ammonia liquida. Oleum olivarum.
22	12	923	
22	12	923	Alcoholes aquosi, commonly called aqua vitæ.
20	10	935	
18	8	948	
13	3	980	Vina Burgundum. Vina Burdigalense.
12	2	986	
11	1	993	
10	0	1000	Aqua stillata vulgaris.

Areom.	Sp. Gr.	*Fluids heavier than water.*
0	1000	Aqua stillata vulgaris.
1	1007	Acetum stillatitium.
	1009	
2	1014	Acetum vulgare.
4 5	1032	Lac vaccinum.
5	1036	Acetas ammoniæ.
10	1075	Acidum aceticum densius.
12	1091	
20	1161	
21	1180	Acidum hydrocloricum liquidum.
35	1210	
30	1261	Syrupus bulliens.
35	1321	Syrupus refrigeratus. Acidum nitricum vulgare.
40	1384	Acidum nitricum densius.
41	1398	
45	1454	
45	1454	Acidum phosphoricum, for medical use.
50	1532	
60	1714	
66	1847	Acidum sulphuricum densissimum.
70	1946	Acidum phosphoricum densissimum.

Comparison of the Degrees of Baumé's Hydrometer with Sp. Gr. *.

For Fluids lighter than Water.

Degree of Areometer.	Specific Gravity			Degree of Areometer.	Specific Gravity		
	By Baumé, *a.*	In Pharm. Batav. *b.*	By Beck. *c.*		By Baumé, *c.*	In Pharm. Batav. *b.*	By Beck, *c.*
0		1000	1.0000	32	0.8638	819	0.8415
1		993	0.9941	33	0.8584	814	0.8374
2		987	0.9883	34	0.8531	810	0.8333
3		980	0.9826	35	0.8479	805	0.8292
4		974	0.9770	36	0.8428	800	0.8252
5		967	0.9714	37	0.8378	796	0.8212
6		961	0.9659	38	0.8329	792	0.8173
7		954	0.9604	39	0.8281	787	0.8133
8		948	0.9550	40	0.8233	782	0.8095
9		941	0.9497	41	0.8186	778	0.8056
10	1.0000	935	0.9444	42	0.8139	774	0.8018
11	0.9930	929	0.9392	43	0.8093	770	0.7981
12	0.9861	923	0.9340	44	0.8047	766	0.7943
13	0.9792	917	0.9289	45	0.8001	762	0.7906
14	0.9724	911	0.9239	46	0.7956	758	
15	0.9657	906	0.9189	47	0.7911	754	
16	0.9591	900	0.9139	48	0.7866	750	
17	0.9526	895	0.9090	49	0.7821	746	
18	0.9462	889	0.9042	50	0.7777	742	
19	0.9399	884	0.8994	51	0.7733		
20	0.9336	878	0.8947	52	0.7689		
21	0.9274	873	0.8900	53	0.7646		
22	0.9212	868	0.8854	54	0.7603		
23	0 9151	863	0.8808	55	0.7560		
24	0 9091	858	0.8762	56	0.7518		
25	0.9032	853	0.8717	57	0.7476	712?	
26	0.8974	847	0.8673	58	0.7435		
27	0.8917	842	0.8629	59	0.7394		
28	0.8860	837	0.8585	60	0.7354		
29	0.8804	832	0.8542	61	0.7314		
30	0.8748	828	0.8500	62	0.7251		
31	0.8693	823	0.8457				

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* Baumé's hydrometer is used commonly in France, Beck's in Germany. In the Pharmacopœia Batava a modification of that of Baumé was introduced, which assumed distilled water as the *zero* for fluids lighter as well as heavier than water, and which has met with the approbation of scientific men. Both are inserted for greater facility of reference; *a.* calculated by Huss; *b.* Pharm. Bat. nearly the mean between Mr Nicolson and D'Arcet, said to be the best, by Henry and Guibourt; *e.* calculated by Engelman.

Comparative Scale of Baumé's Hydrometer with Sp. Gr.

For Fluids heavier than Water.

Degree of Areometer.	Specific Gravity			Degree of Areometer.	Specific Gravity		
	By Baumé, *a.*	In Pharm. Batav. *b.*	By Beck, *c.*		By Baumé, *a.*	In Pharm. Batav. *b.*	By Beck, *c.*
0	1.0000	1000	1.0000	41	1.3947	1398	1.3178
1	1.0070	1007	1.0059	42	1.4082	1412	1.3281
2	1.0141	1014	1.0119	43	1.4219	1426	1.3386
3	1.0213	1022	1.0180	44	1.4359	1440	1.3492
4	1.0286	1029	1.0241	45	1.4501	1454	1.3600
5	1.0360	1036	1.0303	46	1.4645	1470	1.3710
6	1.0435	1044	1.0366	47	1.4792	1485	1.3821
7	1.0511	1052	1.0429	48	1.4942	1501	1.3934
8	1.0588	1060	1.0494	49	1.5096	1516	1.4050
9	1.0666	1067	1.0559	50	1.5253	1532	1.4167
10	1.0745	1075	1.0625	51	1.5413	1549	1.4286
11	1.0825	1083	1.0692	52	1.5576	1566	1.4407
12	1.0906	1091	1.0759	53	1.5742	1583	1.4530
13	1.0988	1100	1.0828	54	1.5912	1601	1.4655
14	1.1071	1108	1.0897	55	1.6086	1618	1.4783
15	1.1155	1116	1.0968	56	1.6264	1637	1.4912
16	1.1240	1125	1.1039	57	1.6446	1656	1.5044
17	1.1326	1134	1.1111	58	1.6632	1676	1.5179
18	1.1414	1143	1.1184	59	1.6823	1695	1.5315
19	1.1504	1152	1,1258	60	1.7019	1715	1.5454
20	1.1596	1161	1.1333	61	1.7220	1736	1.5596
21	1.1690	1171	1.1409	62	1.7427	1758	1.5741
22	1.1785	1180	1.1486	63	1.7640	1779	1.5888
23	1.1882	1190	1.1565	64	1.7858	1801	1.6038
24	1.1981	1199	1.1644	65	1.8082	1823	1.6190
25	1.2082	1210	1.1724	66	1.8312	1847	1.6346
26	1.2184	1221	1.1806	67	1.8548	1872	1.6505
27	1.2288	1231	1.1888	68	1.8790	1897	1.6667
28	1.2394	1242	1.1972	69	1.9038	1921	1.6832
29	1.2502	1252	1.2057	70	1.9291	1946	1.7000
30	1.2612	1261	1.2143	71	1.9548	1974	1.7172
31	1.2724	1275	1.2230	72	1.9809	2020	1.7347
32	1.2838	1286	1.2319	73	2.0073	2031	1.7526
33	1.2954	1298	1.2409	74	2.0340	2054	1.7708
34	1.3072	1309	1,2500	75	2.0610	2087	1.7895
35	1.3190	1321	1.2593	76		2116	1.8085
36	1.3311	1334	1.2687	77			1.8280
37	1.3434	1346	1.2782	78			1.8478
38	1.3559	1359	1.2879	79			1.8681
39	1.3686	1372	1.2977	80			1.8889
40	1.3815	1384	1.3077				

CORRESPONDENCE BETWEEN DIFFERENT THERMOMETERS.

Fahrenheit's thermometer is universally used in this kingdom. In it the range between the freezing and boiling points of water is divided into 180 degrees; and as the greatest possible degree of cold was supposed to be that produced by mixing snow and muriate of soda, it was made the zero; hence the freezing point of water became 32°, and the boiling point 212°.

The Centigrade thermometer places the zero at the freezing point, and divides the range between it and the boiling point into 100°. This has long been used in Sweden, under the title of Celsius's thermometer.

Reaumur's thermometer, which was formerly used in France, divides the space between the freezing and boiling of water into 80°, and places the zero at the freezing point.

Wedgwood's pyrometer is only intended to measure very high temperatures. According to its author, its zero corresponds with 1077 of Fahrenheit's, and each degree of Wedgwood is equal to 130 of Fahrenheit. Guyton Morveau has, however, given good reason for believing that the zero is placed too high, and that the measure of the degree of this scale has been much overrated; and he accordingly fixes the zero of Wedgwood at 517.579 Fahrenheit, and reduces the measure of the degree of Wedgwood to 62.5 of Fahrenheit.

De Lisle's thermometer is used in Russia. The graduation begins at the boiling point, and increases towards the freezing point. The boiling point is marked 0, and the freezing point 150.

Therefore $180°\ \text{F.} = 100°\ \text{C.} = 80\ \text{R.} = \frac{18}{13}\ \text{W, or} = \frac{180}{62.5}\ \text{G.M.}$

Formulæ.

1. To reduce centigrade degrees to those of Fahrenheit, multiply by 9, and divide by 5, and to the quotient add 32, that is, $\frac{\text{C.}\times 9}{5} + 32 = \text{F.}$

2. To reduce Fahrenheit's degrees to centigrade, $\frac{\text{F.}-32\times 5}{9} = \text{C.}$

3. To reduce Reaumur's to Fahrenheit's, $\frac{\text{R.}\times 9}{4} + 32 = \text{F.}$

4. To convert Fahrenheit to Reaumur, $\frac{\text{F.}-32\times 4}{9} = \text{R.}$

5. To reduce Wedgwood's degrees to those of Fahrenheit, $\text{W.}\times 130 + 1077 = \text{F.}$; or, according to Guyton Morveau's estimate, $\text{W.}\times 62.5 + 517.579 = \text{F.}$

6. Inversely, to reduce Fahrenheit to Wedgwood, $\frac{\text{F.}-1077}{130} = \text{W.}$;

or according to Guyton Morveau, $\frac{\text{F.}-517.579}{62.5} = \text{W.}$

Comparative Scale of Thermometers,

Fahr.	*Centigr.*	*Reaumur.*	*Fahr.*	*Centigr.*	*Reaumur.*	*Fahr.*	*Centigr.*	*Reaumur.*
—40°	— 40°	—32°	+ 2	—16.67	—13.33	44	+ 6.67	5.33
39	39.44	31.56	3	16.11	12.89	45	7.22	5.78
38	38.89	31.11	4	15.56	12.44	46	7.78	6.22
37	38.33	30.67	5	15	12	47	8.33	6.67
36	37.78	30.22	6	14.44	11.56	48	8.89	7.11
35	37.22	29.78	7	13.89	11.11	49	9.44	7.56
34	36.67	29.33	8	13.33	10.67	50	10	8
33	36.11	28.89	9	12.78	10.22	51	10.56	8.44
32	35.56	28.44	10	12.22	9.78	52	11.11	8.89
31	35	28	11	11.67	9.33	53	11.67	9.33
30	34.44	27.56	12	11.11	8.89	54	12.22	9.78
29	33.89	27.11	13	10.56	8.44	55	12.78	10.22
28	33.33	26.67	14	10	8	56	13.33	10.67
27	32.78	26.22	15	9.44	7.56	57	13.89	11.11
26	32.22	25.78	16	8.89	7.11	58	14.44	11.56
25	31.67	25.33	17	8.33	6.67	59	15	12
24	31.11	24.89	18	7.78	6.22	60	15.56	12.44
23	30.56	24.44	19	7.22	5.78	61	16.11	12.89
22	30	24	20	6.67	5.33	62	16.67	13.33
21	29.44	23.56	21	6.11	4.89	63	17.22	13.78
20	28.89	23.11	22	5.56	4.44	64	17.78	14.22
19	28.33	22.67	23	5	4	65	18.33	14.67
18	27.78	22.22	24	4.44	3.56	66	18.89	15.11
17	27.22	21.78	25	3.89	3.11	67	19.44	15.56
16	26.67	21.33	26	3.33	2.67	68	20	16
15	26.11	20.89	27	2.78	2.22	69	20.56	16.44
14	25.56	20.44	28	2.22	1.78	70	21.11	16.89
13	25	20	29	1.67	1.33	71	21.67	17.33
12	24.44	19.56	30	1.11	0.89	72	22.22	17.78
11	23.89	19.11	31	0.56	0.44	73	22.78	18.22
10	23.33	18.67	32	0	0	74	23.33	18.67
9	22.78	18.22	33	+ 0.56	+ 0.44	75	23.89	19.11
8	22.22	17.78	34	1.11	0.89	76	24.44	19.56
7	21.67	17.33	35	1.67	1.33	77	25	20
6	21.11	16.89	36	2.22	1.78	78	25.56	20.44
5	20.56	16.44	37	2.78	2.22	79	26.11	20.89
4	20	16	38	3.33	2.67	80	26.67	21.33
3	19.44	15.56	39	3.89	3.11	81	27.22	21.78
2	18.89	15.11	40	4.44	3.56	82	27.78	22.22
1	18.33	14.67	41	5	4	83	28.33	22.67
0	17.78	14.22	42	5.56	4.44	84	28.89	23.11
+ 1	17.22	13.78	43	6.11	4.89	85	29.44	23.56

Fahrenheit, Centigrade, and Reaumur.

Fahr.	*Centigr.*	*Reaumur.*	*Fahr.*	*Centigr.*	*Reaumur.*	*Fahr.*	*Centigr.*	*Reaumur.*
+86	+30	+24	+129	+53.89	+43.11	+171	+77.22	+61.78
87	30.56	24.44	130	54.44	43.56	172	77.78	62.22
88	31.11	24.89	131	55	44	173	78.33	62.67
89	31.67	25.33	132	55.56	44.44	174	78.89	63.11
90	32.22	25.78	133	56.11	44.89	175	79.44	63.56
91	32.78	26.22	134	56.67	45.33	176	80	64
92	33.33	26.67	135	57.22	45.78	177	80.56	64.44
93	33.89	27.11	136	57.78	46.22	178	81.11	64.89
94	34.44	27.56	137	58.33	46.67	179	81.67	65.33
95	35	28	138	58.89	47.11	180	82.22	65.78
96	35.56	28.44	139	59.44	47.56	181	82.78	66.22
97	36.11	28.89	140	60	48	182	83.33	66.67
98	36.67	29.33	141	60.56	48.44	183	83.89	67.11
99	37.22	29.78	142	61.11	48.89	184	84.44	67.56
100	37.78	30.22	143	61.67	49.33	185	85	68
101	38.33	30.67	144	62.22	49.78	186	85.56	68.44
102	38.89	31.11	145	62.78	50.22	187	86.11	68.89
103	39.44	31.56	146	63.33	50.67	188	86.67	69.33
104	40	32	147	63.89	51.11	189	87.22	69.78
105	40.56	32.44	148	64.44	51.56	190	87.78	70.22
106	41.11	32.89	149	65	52	191	88.33	70.67
107	41.67	33.33	150	65.56	52.44	192	88.89	71.11
108	42.22	33.78	151	66.11	52.89	193	89.44	71.56
109	42.78	34.22	152	66.67	53.33	194	90	72
110	43.33	34.67	153	67.22	53.78	195	90.56	72.44
111	43.89	35.11	154	67.78	54.22	196	91.11	72.89
112	44.44	35.56	155	68.33	54.67	197	91.67	73.33
113	45	36	156	68.89	55.11	198	92.22	73.78
114	45.56	36.44	157	69.44	55.56	199	92.78	74.22
115	46.11	36.89	158	70	56	200	93.33	74.67
116	46.67	37.33	159	70.56	56.44	201	93.89	75.11
117	47.22	37.78	160	71.11	56.89	202	94.44	75.56
118	47.78	38.22	161	71.67	57.33	203	95	76
119	48.33	38.67	162	72.22	57.78	204	95.56	76.44
120	48.89	39.11	163	72.78	58.22	205	96.11	76.89
121	49.44	39.56	164	73.33	58.67	206	96.67	77.33
122	50	40	165	73.89	59.11	207	97.22	77.78
123	50.56	40.44	166	74.44	59.56	208	97.78	78.22
124	51.11	40.89	167	75	60	209	98.33	78.67
125	51.67	41.33	168	75.56	60.44	210	98.89	79.11
126	52.22	41.78	169	76.11	60.89	211	99.44	79.56
127	52.78	42.22	170	76.67	61.33	212	100	80
128	53.33	42.67						

Table of the Effects of Heat.

1. FREEZING POINTS OF LIQUIDS, AND MELTING POINT OF SOLIDS.

Fahren.	
—90	Greatest artificial cold observed.
—55	Strongest nitric acid freezes (Cavendish.)
—46	Ether and liquid ammonia freeze.
—39	Mercury freezes.
—36	Sulphuric acid freezes, (Thomson.)
—22	Acetous acid freezes.
—11	2 Alcohol + 1 water freeze.
—7	Brandy freezes.
+1	Strongest sulphuric acid freezes, (Cavendish.)
4	Solution freezes of 1 salt in water 3.
7	———————— 1 salt in water 4.
8	———————— 1 sal ammoniac in water 4.
16	Oil of turpentine freezes, (Margueron.)
20	Strong wines freeze.
23	Fluoric acid freezes.
	Oils of bergamot and cinnamon freeze.
25	Human blood freezes.
28	Vinegar freezes.
30	Milk freezes.
32	Water freezes.
36	Olive oil freezes.
40	Equal parts of sulphur and phosphorus melt.
42	Sulphuric acid, specific gravity, 1.741 freezes.
45	—————————————— 1.78 freezes, (Keir.)
50	Strong acetic acid.
64	Oil of aniseeds freezes.
82	Adipocire of muscle melts.
97	Lard melts, (Nicholson.)
99	Phosphorus melts, (Pelletier.)
104	Resin of bile melts.
109	Myrtle wax melts, (Cadet.)
112	Stearin from hogs lard.
112	Spermaceti melts, (Bostock.)
127	Tallow (Nicholson) 92 (Thomson.)
142	Bees wax.
145	Ambergris, (La Grange.)
150	Potassium.
155	Bleached wax, (Nicholson.)
200	Sodium perfectly fluid.
210	Bismuth, 5 parts, tin 3, lead 2, (Dalton.)
	Iodine, (Gay Lussac.)
234	Sulphur (Hope,) 218 (Thomson,) 185 (Kirwan.)
235	Adipocire of biliary calculi (Fourcroy.)
283	Tin and bismuth, equal parts.
303	Camphor (175 Cent. 348 F.)

Fahren.		*Wedg.*
334	Tin 3, lead 2; or tin 2, bismuth 1.	
442	Tin (Crichton,) (413 Irvine.)	
460	Tin 1, lead 4.	
476	Bismuth, (Irvine.)	
612	Lead (Crichton,) (594 Irvine,) (540 Newton.)	
700	Zinc.	
809	Antimony.	
3807	Brass,	21
4587	Copper,	27
4717	Silver,	28
5237	Gold,	32
17977	Cobalt, cast-iron,	130
20577	Nickel,	150
21097	Soft nails,	154
21637	Iron,	158
21877	Manganese,	160
23177	Platinum, Tungsten, Molybdenum, Uranium, Titanium, &c.	170+

2. SOLIDS AND LIQUIDS VOLATILIZED.

14	Liquid sulphurous acid boils, (Bussy.)
98	Ether boils.
113	Fuming sulphurous acid boils, (Bussy.)
126	Bisulphuret of carbon boils.
140	Liquid ammonia boils.
145	Camphor sublimes, (Venturi,) (400 Fahr.)
170	Sulphur evaporates, (Kirwan.)
176	Alcohol (174 Black,) (173 sp. gr. 0.800 Henry.)
212	Water boils.
219	Phosphorus distils, (Pelletier.)
225	Water saturated with sea salt boils.
230	Muriate of lime boils, (Dalton.)
242	Nitrous acid boils.
248	Nitric acid boils.
283	White oxide of arsenic sublimes.
304	Oil of turpentine boils, (Dr Ure.)
316	Petroleum boils, (Dr Ure.)
540	Metallic arsenic sublimes.
554	Phosphorus boils in close vessels.
570	Sulphur boils, (600 Davy.)
590	Sulphuric acid boils, (Dalton,) (546 Black.)
600	Linseed oil boils.
660	Mercury, (Dalton,) (644 Secondat,) (600 Black,) (672 Irvine,) (656 Petit and Dulong.)

3. MISCELLANEOUS EFFECTS OF HEAT.

—90	Greatest cold produced by Mr Walker.
—50	Natural cold observed at Hudson's Bay.
—23	Observed on the surface of the snow at Glasgow, 1780.

Fahren.		*Wedg.*
0	Equal parts, snow and salt.	
+43	Phosphorus burns slowly.	
59	Vinous fermentation begins.	
66	to 135, Animal putrefaction.	
75	to 80, Summer heat in Britain.	
77	Vinous fermentation rapid; acetous begins.	
80	Phosphorus burns in oxygen, (104 Gottling.)	
88	Acetification ceases, phosphorus ductile.	
96	to 100, Animal temperature.	
107	Feverish heat.	
122	Phosphorus burns vividly (Fourcroy) (148 Thomson.)	
130	Ammonia disengaged from water.	
165	Albumen coagulates (156 Black.)	
303	Sulphur burns slowly.	
600	Boracium burns.	
635	Lowest ignition of iron in the dark.	
750	Iron bright in the dark.	
800	Hydrogen burns, (1000 Thomson.)	
802	Charcoal burns, (Thomson.)	
884	Iron red in twilight.	
1050	Iron red hot in a common fire.	
1077	Iron red in day light,	1
1300	Azotic gas burns,	2
1807	Enamel colours burned,	6
2897	Diamond burns, (Mackenzie) (5000 Morveau,)	14
5237	Settling heat of plate glass,	29
6507	Delft ware fired,	40
8480	Working heat of plate glass,	57
10177	Flint glass furnace,	70
12257	Cream-coloured ware fired,	86
13297	Worcester china vitrified,	94
14337	Stone ware fired,	102
14727	Chelsea china fired,	105
15637	Derby china fired,	112
15897	Flint glass furnace, greatest heat,	114
16007	Bow china vitrified,	121
16807	Plate glass, greatest heat,	124
17327	Smith's forge,	125
20577	Hessian crucible fused,	150
25127	Greatest heat observed,	185
	Extremity of Wedgwood's scale,	240

Table of High Degrees of Heat, according to the correction of Wedgwood's scale by Guyton Morveau.

Reaum.	*Cent.*	*Fahr.*	*Wedg.*	
215.9	269.9	517.76	0	Red heat in day light.
252.4	315.6	599.6		Linseed oil boils.
257.8	322.2	612.		Lead melts.
271.4	339.3	642.75	2	Mercury boils.
299.2	374.	705.25	3	Zinc melts.
382.6	478.2	892.74	6	Enamels melt.
410.2	512.9	955.23	7	Antimony melts.
438.1	547.6	1017.73	8	Copper 1 and tin 3 melt.
465.8	582.3	1080.23	9	Silver 1 and tin 1 melt.
521.8	651.8	1205.22	11	Copper and tin, equal parts, melt.
632.6	790.7	1455.21	15	Copper 3 and tin 1 melt.
799.2	998.9	1836.17	21	Brass melts.
827.	1033.7	1892.67	22	Silver melts.
965.9	1207.3	2205.15	27	Copper melts.
1104.8	1380.9	2517.63	32	Gold melts.
2715.8	3394.7	6196.40	90	Iron sweating heat.
2854.7	3568.3	6508.88	95	Iron welding heat.
3549.1	4436.3	8071.28	120	Porcelain of china softens.
3688.	4609.9	8383.76	125	Smiths forge.
3826.9	4783.5	8696.24	130	Cast iron melts.
4243.6	5651.5	9633.68	155	Porcelain melts.
4382.4	5825.1	10517.12	160	Manganese melts.
4821.3	5998.7	10829.60	165	Heat of Macquer's furnace.
4938.0	6172.3	11142.08	170	Furnace with three blasts.
5076.9	6345.9	11454.56	175	Soft iron melts.
*	*	*	*	Nickel melts.
				Platinum melts.

Temperature at which various Pharmaceutical Phenomena take place, as indicated in the Centigrade, Reaumur, and Fahrenheit's scale, in the French Pharmacopœia.

Reaumur.	*Centigrad.*	*Fahrenheit.*	
84	105.	221	Syrup boils.
83	103.75	218¾	Water in which there is dissolved $\frac{2}{10}$ of muriate of soda boils.
82	102.50	216½	Water with $\frac{4}{10}$ of muriate of lime boils.
80	100.00	212	Common water boils.
80	100.00	212	Heat of water placed in a boiling *balneum maris*, prepared with water containing $\frac{2}{10}$ of muriate of soda, or at 218¾ F.
78	97.5	207	Heat of water in a boiling water bath of pure water. Olive oil and Castor oil acquire the same temperature in the same bath.
65	81.25	178¼	Alcohol, sp. gr. 923, boils in a water bath.
65	81.25	178¼	The same degree of temperature is observed when water begins to simmer.
63	78.75	173¾	Alcohol, sp. gr. 878, boils in a water bath.
62½	78.125	172⅝	Alcohol, sp. gr. 847, boils in a water bath.
62	77.50	171½	Alcohol, sp. gr. 827, boils in a water bath.
60	75.00	167	The heat of the water bath in which pure ether will distil.
35	43.75	110¾	The heat at which tea and other warm drinks are taken.
			The feet are commonly immersed in water heated to 117½ F., but not without pain; nor can they bear it unless they are not moved.
x	*x*	*x*	The heat of sand baths is so uncertain, as not to be capable of being ascertained or defined, unless by trying it during the operation.
40 20	50.00 25.00	122 77	Various degrees of heat exist within these limits, which are employed to dry fruits, herbs, flowers, and other simples.
30 28	37.50 35.00	99½ 95	These degrees of heat are particularly suited to the digesting of tinctures.
20 15	25.00 18.75	77 65¾	This degree of the scale constitutes the temperature of the air at which fermentation proceeds.
14	75.50	63½	This temperature of the air is used for examining the density of fluids by the hydrometer.
0	0.0	32	This is the temperature at which ice melts; it is also the temperature at which receivers are kept which are employed in various distillations; and also that at which the gravity of very volatile liquids is ascertained.

TABLES.

Frigorific Mixtures, selected from Mr Walker's Publication, 1808, *communicated by the Author.*

Frigorific Mixtures, *without Ice.*

Mixtures.	*Thermometer sinks.*	*Degree of cold produced.*
Muriate of ammonia 5 parts Nitrate of potash 5 Water 16	From + 50° to + 10°	40
Sulphate of soda 3 parts Diluted nitric acid 2	From + 50 to — 3	53
Sulphate of soda 6 parts Nitrate of ammonia 5 Diluted nitric acid 4	From +50 to — 14	64
Phosphate of soda 9 parts Nitrate of ammonia 6 Diluted nitric acid 4	From + 50 to — 21	71

N. B.—If the materials are mixed at a *warmer* temperature than that expressed in the table, the effect will be proportionally *greater;* thus if the most powerful of these mixtures be made when the air is + 85°, it will sink the thermometer to + 2°.

Frigorific Mixtures, *with Ice.*

Mixtures.	*Thermometer sinks.*	*Degree of cold produced.*
Snow, or pounded ice, 2 parts Muriate of soda, 1	*From any temperature.* to —5°	*
Snow, or pounded ice, 12 parts Muriate of soda, 5 Nitrate of ammonia, 5	to —25	*
Snow 3 parts Diluted sulphuric acid 2	From + 32 to —23	55
Snow, 2 parts Cryst. muriate of lime, 3	From + 32 to —50	82

N. B.—The reason for the *omissions* in the last column of this table is, the thermometer sinking in these mixtures to the degree mentioned in the preceding column, *and never lower,* whatever may be the temperature of the materials at mixing.

Combinations of Frigorific Mixtures.

Mixtures.	*Thermometer sinks.*	*Degree of cold produced.*
Snow - - - 3 parts Diluted nitric acid 2	From 0 to —46	46
Snow - - 8 parts Diluted sulphuric acid 3 } Diluted nitric acid 3 }	From —10 to —56	46
Snow - - 2 parts Muriate of lime - 3	From —15 to —68	53
Snow - - 8 parts Diluted sulphuric acid 10	From —68 to —91	23

N. B.—The materials in the first column are to be cooled, previously to mixing, to the temperature required, by mixtures taken from either of the preceding tables.

Electrical System of Bodies by Ritter.

NEGATIVE POLE.

INSULATORS.	CONDUCTORS.
Sulphur.	Water.
Sealing wax.	Oxide of manganese.
Black silk.	Metallic sulphurets.
White silk.	Charcoal.
Paper.	Silver.
Wool.	Copper.
Glass.	Iron.
Tourmalin.	Lead.
Diamond.	Zinc.

POSITIVE POLE.

Dr Henry has adopted the distribution of Elementary Bodies into Electro-negative and Electro-positive. To the former class belong

Oxygen.
Chlorine.
Iodine.
Fluorine.

To the latter all other bodies.

CONDUCTORS.

Perfect.	*Imperfect.*
Metals.	Water.
Plumbago.	Alcohol.
Charcoal.	Ether.
Mineral acids.	Sulphur.
Saline solutions.	Oils.
	Resins.
	Metallic oxides.
	Compounds of chlorine.

Table of some Galvanic Circles composed of two Perfect and one Imperfect Conductor.

Perfect.		*Imperfect.*
Zinc.	Any two of these solid conductors may be used, and each of them is the positive pole to all the metals below it in the list, and the negative to those above. This relation is reversed when the imperfect conductor is the solution of a hydrosulphuret.	Solutions of
Iron.		Nitric acid.
Tin.		Muriatic acid.
Lead.		Sulphuric acid.
Copper.		Sal ammoniac.
Silver.		Nitre.
Gold.		Other neutral salts.
Platinum.		
Charcoal.		

Table of Galvanic Circles composed of two Imperfect and one Perfect Conductor.

Imperfect.	*Perfect.*	*Imperfect.*
Solution of	Copper.	Nitric acid.
Alkaline sulphuret.	Silver.	Sulphuric acid.
Potash.	+Lead.—	Muriatic acid.
Soda.	Tin.	Any dilute acid.
The alkaline solutions abstract electricity from the metal.	Zinc.	N. B. The acid solutions transmit electricity to the metal.
	Other metals.	
	Charcoal.	

TABLES OF SIMPLE AFFINITY.

OXYGEN.
Carbon,
Manganese,
Zinc,
Iron,
Tin,
Antimony,
Hydrogen,
Phosphorus,
Sulphur,
Arsenic,
Nitrogen,
Nickel,
Cobalt,
Copper,
Bismuth,
Caloric ?
Mercury,
Silver,
Arsenious acid,
Nitric oxide,
Gold,
Platinum,
Carbonic oxide,
Muriatic acid,
Metallic bases of the earths and alkalies.

OXYGEN [*].
Titanium,
Manganese,
Zinc,
Iron,
Tin,
Uranium,
Molybdenum,
Tungsten,
Cobalt,
Antimony,
Nickel,
Arsenic,
Chromum,
Bismuth,
Lead,
Copper,
Tellurium,
Platinum,
Mercury,
Silver,
Gold.

CARBON.
Oxygen,
Iron,
Hydrogen.

NITROGEN.
Oxygen,
Sulphur ?
Phosphorus,
Hydrogen.

HYDROGEN.
Chlorine,
Oxygen,
Iodine,
Sulphur,
Carbon,
Phosphorus,
Nitrogen.

SULPHUR. PHOSPHORUS ?
Potass,
Soda,
Iron,
Copper,
Tin,
Lead,
Silver,
Bismuth,
Antimony,
Mercury,
Arsenic,
Molybdenum.

POTASS, SODA, AND AMMONIA.
Acids. Sulphuric,
Nitric,
Muriatic,
Phosphoric,
Fluoric,
Oxalic,
Tartaric,
Arsenic,
Succinic,
Citric,
Lactic,
Benzoic,
Sulphurous,
Acetic,
Mucic,
Acids. Boracic,
Nitrous,
Carbonic,
Prussic,
Oil,
Water,
Sulphur.

BARYTA.
Acids. Sulphuric,
Oxalic,
Succinic,
Fluoric,
Phosphoric,
Mucic,
Nitric,
Muriatic,
Suberic,
Citric,
Tartaric,
Arsenic,
Lactic,
Benzoic,
Acetic,
Boracic,
Sulphurous,
Nitrous,
Carbonic,
Prussic,
Sulphur,
Phosphorus,
Water,
Fixed oil.

STRONTIA.
Acids. Sulphuric,
Phosphoric,
Oxalic,
Tartaric,
Fluoric,
Nitric,
Muriatic,
Succinic,
Acetic,
Arsenic,
Boracic,
Carbonic,
Water.

LIME.
Acids. Oxalic,
Sulphuric.
Acids. Tartaric,
Succinic,
Phosphoric,
Mucic,
Nitric,
Muriatic,
Suberic,
Fluoric,
Arsenic,
Lactic,
Citric,
Malic,
Benzoic,
Acetic,
Boracic,
Sulphurous,
Nitrous,
Carbonic,
Prussic,
Sulphur,
Phosphorus,
Water,
Fixed oil.

MAGNESIA.
Acids. Oxalic,
Phosphoric,
Sulphuric,
Fluoric,
Arsenic,
Mucic,
Succinic,
Nitric,
Muriatic,
Tartaric,
Citric,
Malic ?
Lactic,
Benzoic,
Acetic,
Boracic,
Sulphurous,
Nitrous,
Carbonic
Prussic.
Sulphur.

ALUMINA.
Acids. Sulphuric,
Nitric,
Muriatic,
Oxalic,

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[*] Vauquelin's table of the affinity of the metals for oxygen, according to the difficulty with which their oxides are decomposed by heat.

Tables of Simple Affinity,—continued.

Acids. Arsenic,
Fluoric,
Tartaric,
Succinic,
Mucic,
Citric,
Phosphoric,
Lactic,
Benzoic,
Acetic,
Boracic,
Sulphurous,
Nitrous,
Carbonic,
Prussic.

SILICA.

Acid. Fluoric,
Potass.

OXIDE OF PLATINUM.
OXIDE OF GOLD*.

Acids. Gallic,
Muriatic,
Nitric,
Sulphuric,
Arsenic,
Fluoric,
Tartaric,
Phosphoric,
Oxalic,
Citric,
Acetic,
Succinic,
Prussic,
Carbonic,
Ammonia.

OXIDE OF SILVER.

Acids. Gallic,
Muriatic,
Oxalic,
Sulphuric,
Mucic,
Phosphoric,
Sulphurous,
Nitric,
Arsenic,
Fluoric,
Tartaric,
Citric,
Lactic,
Succinic,
Acetic,
Prussic,
Carbonic,
Ammonia.

OXIDE OF MERCURY.

Acids. Gallic,
Muriatic,
Oxalic,
Succinic,
Arsenic,
Phosphoric,
Sulphuric,
Mucic,
Tartaric,
Citric,
Malic,
Sulphurous,
Nitric,
Fluoric,
Acetic,
Benzoic,
Boracic,
Prussic,
Carbonic.

OXIDE OF LEAD.

Acids. Gallic,
Sulphuric,
Mucic,
Oxalic,
Arsenic,
Tartaric,
Phosphoric,
Muriatic,
Sulphurous,
Suberic,
Nitric,
Fluoric,
Citric,
Malic,
Succinic,
Lactic,
Acetic,
Benzoic,
Boracic,
Prussic,
Carbonic,
Fixed oils,
Ammonia.

OXIDE OF COPPER.

Acids. Gallic,
Oxalic,
Tartaric,
Muriatic,
Sulphuric,
Acids. Mucic,
Nitric,
Arsenic,
Phosphoric,
Succinic,
Fluoric,
Citric,
Lactic,
Acetic,
Boracic,
Prussic,
Carbonic,
Fixed alkalies,
Ammonia.
Fixed oils.

OXIDE OF ARSENIC.

Acids. Gallic,
Muriatic,
Oxalic,
Sulphuric,
Nitric,
Tartaric,
Phosphoric,
Fluoric,
Succinic,
Citric,
Acetic,
Prussic,
Fixed alkalies,
Ammonia,
Fixed oils,
Water.

OXIDE OF IRON.

Acids. Gallic,
Oxalic,
Tartaric,
Camphoric,
Sulphuric,
Mucic,
Muriatic,
Nitric,
Phosphoric,
Arsenic,
Fluoric,
Succinic,
Citric,
Lactic,
Acetic,
Boracic,
Prussic,
Carbonic.

OXIDE OF TIN †.

Acids. Gallic,
Muriatic,
Sulphuric,
Oxalic,
Tartaric,
Arsenic,
Phosphoric,
Nitric,
Succinic,
Fluoric,
Mucic,
Citric,
Lactic,
Acetic,
Boracic
Prussic,
Ammonia.

OXIDE OF ZINC.

Acids. Gallic,
Oxalic,
Sulphuric,
Muriatic,
Mucic,
Nitric,
Tartaric,
Phosphoric,
Citric,
Succinic,
Fluoric,
Arsenic,
Lactic,
Acetic,
Boracic,
Prussic,
Carbonic,
Fixed alkalies,
Ammonia.

OXIDE OF ANTIMONY.

Acids. Gallic,
Muriatic,
Benzoic,
Oxalic,
Sulphuric,
Nitric,
Tartaric,
Mucic,
Phosphoric,
Citric,
Succinic,
Fluoric,
Arsenic,
Lactic,

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* Omitting the oxalic, citric, succinic, and carbonic, and adding sulphuretted hydrogen after ammonia.

† Bergman places the tartaric before the muriatic.

Tables of Simple Affinity,—continued.

Acids. Acetic,
Boracic,
Prussic,
Fixed alkalies,
Ammonia.

SULPHURIC ACID.
PRUSSIC *.
Baryta,
Strontia,
Potass,
Soda,
Lime,
Magnesia,
Ammonia,
Glucina,
Gadolina,
Alumina,
Zirconia,
Metallic Oxides.

SULPHUROUS ACID.
SUCCINIC †.
Baryta,
Lime,
Potass,
Soda,
Strontia,
Magnesia,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic Oxides.

PHOSPHORIC ACID.
CARBONIC ‡.
Baryta,
Strontia,
Lime,
Potass,
Soda,
Ammonia,
Magnesia,
Glucina,
Alumina,
Zirconia,
Metallic Oxides,
Silica.

PHOSPHOROUS ACID.
Lime,
Baryta,
Strontia,
Potass,
Soda,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic Oxides.

NITRIC ACID.
MURIATIC §.
Baryta,
Potass,
Soda,
Strontia,
Lime,
Magnesia,
Ammonia,
Glucina,
Alumina,
Zirconia,
Metallic Oxides.

FLUORIC ACID.
BORACIC ‖.
ARSENIC ¶.
TUNGSTIC.
Lime,
Baryta,
Strontia,
Magnesia,
Potass,
Soda,
Ammonia,
Glucina,
Alumina,
Zirconia,
Silica.

ACETIC ACID.
LACTIC. SUBERIC **.
Baryta,
Potass,
Soda,
Strontia,
Lime,
Ammonia,
Magnesia,
Metallic Oxides,
Glucina,
Alumina,
Zirconia.

OXALIC ACID.
TARTARIC.
CITRIC ††.
Lime,
Baryta,
Strontia,
Magnesia,
Potass,
Soda,
Ammonia,
Alumina,
Metallic Oxides,
Water,
Alkohol.

BENZOIC ACID.
White Oxide of Arsenic,
Potass,
Soda,
Ammonia,
Baryta,
Lime,
Magnesia,
Alumina.

CAMPHORIC ACID.
Lime,
Potass,
Soda,
Baryta,
Ammonia,
Alumina,
Magnesia.

FIXED OILS.
Lime,
Baryta,
Potass,
Soda,
Magnesia,
Oxide of Mercury,
Other metallic oxides,
Alumina.

ALKOHOL.
Water,
Ether,
Volatile oil,
Alkaline sulphurets.

SULPHURETTED HYDROGEN.
Baryta,
Potass,
Soda,
Lime,
Ammonia,
Magnesia,
Zirconia.

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* With the omission of all after ammonia.

† Ammonia should come before magnesia; and strontia, glucina, and zirconia should be omitted.

‡ Magnesia should stand above ammonia, and alumina and silica should be omitted.

§ Ammonia should stand above magnesia.

‖ Silica should be omitted, and, instead of it, water and alkohol be inserted.

¶ Except silica.

** With the omission of strontia, metallic oxides, glucina and zirconia.

†† Zirconia after alumina.

Relative Attractions at the lowest Temperature of Visible Ignition, by Sir H. Davy.

OXYGEN.	CHLORINE.	SULPHUR.	PHOSPHORUS.
Potassium	Potassium	Potassium	Potassium
Sodium	Sodium	*Sodium*	*Sodium*
Barium	Zinc	Iron	Platinum
Boron	Iron	Copper	Zinc
Carbon	Lead	Palladium	Antimony
Manganesum	Silver	Lead	Sulphur
Zinc	Antimony	*Silver*	
Iron	Bismuth		
Tin	Phosphorus		
Phosphorus	Copper		
Antimony	Sulphur		
Bismuth	Mercury		
Lead	Platinum		
Sulphur	Gold		
Arsenic			
Tungstenum			
Azote			
Palladium			
Mercury			
Silver			
Gold			
Platinum			

Cases of Mutual Decomposition.

1. FROM SIMPLE AFFINITY.

Sulphate of potass -	with	Muriate of baryta
——— soda -	——	Nitrate of potass
——— ammonia -	——	Muriate of potass
——— magnesia -	——	Carbonate of potass
Supersulphate of alumina	——	Muriate of lime
Nitrate of potass -	——	——— baryta
——— ammonia -	——	Phosphate of soda
Muriate of baryta -	——	All the sulphates and nitrates
——— soda -	——	Carbonate of potass
——— lime -	——	Subborate of soda
——— ammonia -	——	Carbonate of potass
Phosphate of soda -	——	Muriate of ammonia
Subborate of soda -	——	Carbonate of potass
Nitrate of silver -	——	Muriate of soda
Acetate of lead -	——	Citrate of potass
Sulphate of mercury -	——	Muriate of soda
Soap of potass -	——	——— soda
——— soda - -	——	Sulphate of lime

2. FROM COMPOUND AFFINITY.

Sulphate of baryta	with	Carbonate of potass
——— baryta	———	——— soda
——— potass	———	Muriate of lime
——— soda	———	Ditto
Muriate of baryta	———	Phosphate of soda
Ditto	———	Subborate of soda
Ditto	———	Carbonate of potass
Ditto	———	——— soda
Ditto	———	——— ammonia
Muriate of lime	———	——— ammonia
Phosphate of soda	———	——— lime
Acetate of lead	———	Sulphate of zinc
Ditto	———	Nitrate of mercury.

Cases of Disposing Affinity.

The formation of water by the action of the sulphuric acid on the compound oxides.

The oxidation of metals by water, in consequence of the presence of an acid.

Table of Incompatible Salts *.

SALTS.	INCOMPATIBLE WITH
1. Fixed alkaline sulphates	Nitrates of lime and magnesia Muriates of lime and magnesia
2. Sulphate of lime	Alkalies Carbonate of magnesia Muriate of barytes
3. Alum	Alkalies Muriate of barytes Nitrate, muriate, carbonate of lime Carbonate of magnesia
4. Sulphate of magnesia	Alkalies Muriate of barytes Nitrate and muriate of lime
5. Sulphate of iron	Alkalies Muriate of barytes Earthy carbonates
6. Muriate of barytes	Sulphates Alkaline carbonates Earthy carbonates

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* That is, salts which cannot exist together in solution, without mutual decomposition.

7. Muriate of lime	Sulphates, except of lime Alkaline carbonates Carbonate of magnesia
8. Muriate of magnesia	Alkaline carbonates Alkaline sulphates
9. Nitrate of lime	Alkaline carbonates Carbonates of magnesia and alumina Sulphates, except of lime.

Table exhibiting the Atomic Weights of the Simple and some Compound Bodies which are connected with Pharmacy.—Extracted from Dr Thomson's First Principles of Chemistry.

	Oxyg. = 1	*Hydr.* = 1
Hydrogen, -	0.125	1
Carbon, -	0.75	6
Oxygen, -	1.	8
Boron, -	1.	8
Silicon, -	1.	8
Carburetted hydrogen,	1.	8
Water, -	1.125	9
Aluminum, -	1.25	10
Lithium, -	1.25	10
Fluoric acid, -	1.25	10
Naphthaline, -	1.25	10
Phosphorus, -	1.5	12
Magnesium, -	1.5	12
Azote,	1.75	14
Carbonic oxide,	1.75	14
Olefiant gas, -	1.75	14
Sulphur, -	2.	16
Silica, -	2.	16
Ammonia, -	2.125	17
Sulphuretted hydrogen,	2.125	17
Deutoxide of hydrogen,	2.125	17
Glucinum, -	2.25	18
Alumina, -	2.25	18
Lithia, -	2.25	18
Calcium, -	2.5	20
Magnesia, -	2.5	20
Phosphorous acid,	2.5	20
Oil gas, -	2.625	21
Carbonic acid,	2.75	22
Protoxide of azote,	2.75	22
Alcohol, -	2.875	23
Sodium,	3.	24
Boracic acid,	3.	24
Hyposulphurous acid,	3.	24
Nickel,	3.25	26
Cobalt, -	3.25	26
Cyanogen, -	3.25	26
Hydrocyanic acid,	3.375	27
Iron, -	3.5	28
Manganese, -	3.5	28
Iridium, -	3.5	28
Lime, - -	3.5	28
Sulphuret of magnesium	3.5	28
Deutoxide of azote,	3.75	30
Copper, -	4.	32
Tellurium, -	4.	32
Sulphurous acid,	4.	32
Titanium, -	4.25	34
Zinc, -	4.25	34
Yttrium, -	4.25	34
Chlorine, -	4.5	36
Oxalic acid, -	4.5	36
Sulphuret of calcium,	4.5	36
Protoxide of iron,	4.5	36
Protoxide of manganese, - -	4.5	36
Muriatic acid, -	4.625	37
Sulphuric ether, -	4.625	37
Arsenic, -	4.75	38
Hyponitrous acid,	4.75	38
Potassium, -	5.	40
Selenium, -	5.	40
Oxide of copper,	5.	40
Deutoxide of manganese, -	5.	40
Peroxide of iron,	5.	40

	Oxyg. = 1	*Hydr.* = 1
Sulphuric acid,	5.	40
Oxide of zinc, -	5.25	42
Naphtha, -	5.25	42
Strontium, -	5.5	44
Antimony -	5.5	44
Protoxide of chlorine,	5.5	44
Tritoxide of manganese, -	5.5	44
Protosulphuret of iron,	5.5	44
Nitrous acid, -	5.75	46
Lactic acid, -	5.75	46
Molybdenum,	6.	48
Potash, -	6.	48
Chloride of magnesium, -	6.	48
Sulphuret of copper,	6.	48
Perhydrate of iron,	6.25	49
Cerium, -	6.25	50
Sulphuret of zinc,	6.25	50
Acetic acid, -	6.25	50
Succinic acid, -	6.25	50
Sesquisulphuret of iron, -	6.5	52
Protoxide of antimony, -	6.5	52
Nitric acid, -	6.75	54
Arsenious acid,	6.75	54
Sulphuret of arsenic,	6.75	54
Cadmium, -	7.	56
Palladium, -	7.	56
Deutoxide of antimony, -	7.	56
Chloride of calcium,	7.	56
Tin, - -	7.25	58
Citric acid, -	7.25	58
Chloride of sodium,	7.5	60
Persulphuret of iron,	7.5	60
Peroxide of antimony,	7.5	60
Sulphuret of antimony,	7.5	60
Kermes mineral,	7.625	61
Gallic acid, -	7.75	62
Arsenic acid, -	7.75	62
Sesquisulphuret of arsenic, -	7.75	62
Oxide of cadmium,	8.	64
Chloride of iron,	8.	64
Bisulphuret of copper,	8.	64

	Oxyg. = 1	*Hydr.* = 1
Tartaric acid, -	8.25	64
Protoxide of tin,	8.25	64
Chloride of copper,	8.5	68
Barium, -	8.75	70
Tannin, -	8.75	70
Bismuth, -	9.	72
Suboxide of copper,	9.	72
Hyposulphuric acid,	9.	72
Deutosulphuret of potash, -	9.	72
Uric acid, -	9.	72
Oil of turpentine,	9.125	73
Peroxide of tin,	9.25	74
Bromine, -	35.5	75?
Chloric acid,	9.5	76
Dichloride of calcium,	9.5	76
Chloride of potassium,	9.5	76
Barytes, -	9.75	78
Oxide of bismuth,	10.	80
Disulphuret of copper,	10.	80
Chloride of antimony,	10.	80
Sulphuret of barium,	10.75	86
Tritosulphuret of potass, -	11.	88
Fuming sulphuric acid,	11.125	89
Gum, -	11.25	90
Perchloric acid,	11.5	92
Protochloride of tin,	11.75	94
Platinum, -	12.	96
Perchloride of iron,	12.5	100
Lead, -	13.	104
Sacclactic acid,	13.	104
Quadrosulphuret of potass,	13.	104
Chloride of barium,	13.25	106
Silver, -	13.75	106
Protoxide of lead,	14.	112
Deutoxide of lead,	14.5	116
Oxide of silver,	14.75	118
Peroxide of lead,	15.	120
Protosulphuret of lead,	15.	120
Benzoic acid,	15.	120
Iodine, -	15.5	124
Dichloride of antimony, -	15.5	124
Perchloride of tin,	16.25	130
Chloride of lead,	17.5	140

	Oxyg. = 1	*Hydr.* = 1		*Oxyg.* = 1	*Hydr.* = 1
Chloride of silver,	18.25	146	Persulphuret of mercury, -	29.	232
Iodic acid, -	20.5	164	Chloride of mercury,	29.5	236
Gold, -	25.	200	Margaric acid,	33.	264
Mercury, -	25.	200	Bichloride of mercury,	34.	272
Uranium, -	26.	208	Oleic acid, -	36.	288
Protoxide of mercury,	26.	208	Morphia, -	40.25	322
Peroxide of mercury,	27.	216	Picrotoxia, -	45.	360
Protosulphuret of mercury, -	27.	216	Strychnia, -	47.5	380
Disulphuret of lead,	28.	224	Brucia, -	51.5	412

Table of the Atomic Weights of Salts used in Pharmacy.—Extracted from the General Table of Dr Thomson.

	Atoms. a. b. w.	Weight of Acid.	Base.	Dry salt.	Water.	Crystal.
Alumina, suphate, ...	1.1.7	5	2.25	7.25	7.875	15.125
Alum, sulph. alum. 3 sulph. pot. 1, ...	4.4.25	20	12.75	32.75	28.125	60.875
—— sulph. alum. 3 sulph. amm. 1, ...	4.4.25	20	8.875	28.875	28.125	57.000
—— sulph. alum. 3, sulph. sod. 1, ...	4.4.25	20	10.75	30.75	28.125	58.875
Ammonia, acetate, ...	1.1.7	6.25	2.125	8.375	7.875	16.25
——— carbonate, ...	1.1.	2.75	2.125	3.875	—	3.875
——— sesquicarbonate,	1½.1.1	4.125	2.125	6.250	1.125	7.375
——— bicarbonate, ...	2.1.1	5.5	2.125		1.125	8.75
——— muriate, ...	1.1.0	4.625	2.115	6.75	—	6.75
——— nitrate, ...	1.1.1	6.75	2.125	8.375	1.125	10.
Antimony, (hydrosulphuret (Kermes mineral,)	1.1.0	2.125	5.5	7.625	—	7.625
——— potash-tartrate, ...	2.4.2	16.5	25.5	32.	2.25	34.25
Barytes, carbonate, ...	1.1.0	2.75	9.75	12.5	—	12.5
——— muriate, ...	1.1.1	4.625	9.75	14.395	1.125	15.500
——— sulphate, ...	1.1.0	5.	9.75	14.75	—	14.75
Bismuth, nitrate, ...	1.1.3	6.75	10.	16.75	3.375	20.125
——— dinitrate, ...	1.2.2	6.75	20.	26.75	2.25	29.
Copper, acetate, ...	1.1.1	6.25	6.	11.25	1.125	12.375
——— diacetate, ...	1.2.6	6.25	10.	16.25	6.75	23.
——— subsesquiacetate, ...	1.1½.3	6.25	7.5	13.75	3.375	17.125
——— triacetate,...........	1.3.2	6.25	15.	21.25	2.25	23.5
——— muriate, ...	1.1.2	4.625	5.	9.625	2.25	11.875
——— sulphate, ...	1.1.5	5.	5.	10.	5.625	15.625
——— ammonio-sulph. sulph. cop. 1, s. amm. 1,	2.2.6	10.	7.125	17.125	6.75	23.875
Iron acetate, ...	1.1.3	6.25	4.5	10.75	3.375	14.125
—— carbonate, ...	1.1.0	2.75	4.5	7.25	—	7.25
—— muriate, ...	1.1.3	4.625	4.5	9.125	3.375	12.5
—— nitrate, ...	1.1.7	6.75	4.5	11.25	7.875	19.125
—— persesquinitrate, ...	1½.1.8	10.125	5.	15.125	9.	24.125

	Atoms. a. b. w.	Weight of				
		Acid.	Base.	Dry salt.	Water.	Crystal.
Iron, sulphate,	1.1.7	5.	4.5	9.5	7.875	17.375
—— persesquisulphate,	1½.1.x	7.5	5.	12.55	x	x
—— tartrate,	1.1.2	8.25	4.5	12.7	2.25	15.
—— ammonio-permuriate, persesquinitr. iron 1, mur. amm. 1,	2½.2.0	11.5625	7.125	18.6875		18.6875
Lead, acetate,	1.1.3	6.25	14.	20.25	3.375	23.625
—— diacetate,	1.2.10	6.25	28.	34.25	11.25	45.5
—— trisacetate,	1.3.2	6.25	42.	48.25	2.25	50.5
—— carbonate,	1.1.0	2:75	14.	16.75		16.75
Lime, carbonate,	1.1.0	2.75	3.5	6.25	——	6.25
—— muriate,	1.1.6	4.625	3.5	8.125	6.75	14.875
—— phosphate,	1.1.0	3.5	3.5	7.	——	7.
—— sulphate, anhydrous,	1.1.0	5.	3.5	8.5	——	8.5
———— crystals,	1.1.2	5.	3.5	8.5	2.25	10.75
—— tartrate,	1.1.4	8.25	3.5	11.75	4.5	16.25
Magnesia, carbonate,	1.1.3	2.75	2.5	5.25	3.375	8.625
———— anhydrous,	1.1.0	2.75	2.5	5.25	——	5.25
—— muriate,	1.1.5	4.625	2.5	7.125	5.625	12.75
—— sulphate,	1.1.7	5.	2.5	7.5	7.875	15.375
—— ammonio-phosph. ph. mag. 1, ph. am. 1,	2.2.4	7.	5 625	11.625	4.5	16.125
Mercury, acetate,	1.1.4	6.25	26.	32.25	4.5	36.75
—— nitrate,	1.1.2	6.75	26.	32.75	2.25	35
—— pernitrate	1.1.0	6.75	27.	33.75	——	33.75
—— sulphate,	1.1.2	5.	26.	31.	2.25	33.25
—— persulphate,	1.1.0	5.	27.	32.	——	32.
Potash, acetate,	1.1.2	6.25	6	12.25	2.25	14.5
—— binacetate,	2.1.6	12.5	6	18.5	6.75	25.25
—— binarseniate,	2.1.1	15.5	6	21.5	1.125	22.625
—— carbonate,	1.1.2	2.75	6	8.75	2.25	11.
—— sesquicarbonate,	1½.1.6	4.125	6	10.125	6.75	16.875
—— bicarbonate,	2.1.1	5.5	6	11.5	1.125	12.625
—— nitrate,	1.1.0	6.75	6	12.75	——	12.75
—— oxalate,	1.1.1	4.5	6	10.5	1.125	11.625
—— binoxalate,	2.1.2	9.	6.	15.	2.25	17.25
—— quadroxalate,	4.1.7	18.	6	22.	7.875	31.873
—— sulphate,	1.1.0	5.	6	11.	——	11.
—— bisulphate,	2.1.2	10.	6	16.	2.25	18.25
—— tartrate,	1.1.2	8.25	6	14.25	2.25	16.5
—— bitartrate,	2.1.2	16.5	6.	22.5	2.25	24.75
Silver, nitrate	1.1.0	6.75	14.75	21.5		21.5
Soda, biborate, (borax,)	2.1.8	6.	4		9.	19.
—— carbonate,	1.1.10	2.75	4	6.75	11.25	18.
—— sesquicarbonate,	1½.1.2	4.125	4	8.125	2.25	10.375
—— bicarbonate,	2.1.1	5.5	4	9.5	1.125	10.625
—— phosphate,	1.1.12	3.5	7	7.5	13.5	21
—— biphosphate,	2.1.3½	7.	4.	11.	3.9375	14.9375
—— sulphate,	1.1.10	5.	4.	9.	11.25	20.25
—— tartrate,	1.1.1	8.25	4	12.25	2.25	14.5
—— urate,	1.1.1	9.	4	13.	1.125	14.125
—— ammonio-phosphate, phos. sod. 1, phos. am. 1,	2.2.16	7.	6.125	13,125	18.	31.125
—— potash-tartrate, tart. of pot. 1, tart. of soda 1,	2.28	16.5	10.	26.5	9.	35.5

	Atoms. a.b.w.	Acid.	Base.	Weight of Dry salt.	Water.	Crystal.
Soda, potash-boro-tartrate, bibor. of soda 1, bitartrate of potash, 1, ...	4.2.16	18.	10	28.	18.	46.
Tin, bimuriate, ...	2.1.3	9.25	9.25	18.5	3.375	21.875
Zinc, acetate, ...	1.1.7	6.25	5.25	11.5	7.875	19.375
—— carbonate, ...	1.1.1	2.75	5.25	8.	1.125	9.125
———— anhydrous,	1.1.0	2.75	5.25	8.	——	8.
—— sulphate, ...	1.1.7	5	5.25	10.25	7.875	18.125

Composition of some Organic Bodies, according to Berzelius.

	Oxyg.	*Hydr.*	*Carb.*	*Oxyg.*	*Hydr.*	*Carb.*	*Capacity of saturation.*
Benzoic acid,...........	1 *o*+	3 *h*+	5 *c*	20.02	5.27	74.71	6.69
Gallic acid,............	1 *o*	2 *h*	2 *c*	38.02	5.02	56.96	12.34
Tannin from galls, ...	2 *o*	3 *h*	3 *c*	45.00	4.45	50.55	3.718
Succinic acid, ...	3 *o*	4 *h*	4 *c*	47.923	4.218	47.859	15.9743
Acetic acid, ...	3 *o*	6 *h*	4 *c*	46.934	6.195	46.871	15.63
Sugar of milk, ...	4 *o*	8 *h*	5 *c*	48.348	6.385	45.267	
Sugar, ...	10 *o*	21 *h*	12 *c*	49.083	6.802	44.115	9.98
Potatoe starch, ...	6 *o*	13 *h*	7 *c*	49.583	7.090	43.327	
Gum Arabic,...........	12 *o*	24 *h*	13 *c*	51.456	6.792	41.752	
Citric acid,.............	1 *o*	1 *h*	1 *c*	55.096	3.634	41.270	13.585
Tartaric acid,...........	5 *o*	5 *h*	4 *c*	59.200	3.912	36.888	11.976
Saclactic acid,..........	4 *o*	5 *h*	3 *c*	60.818	5.018	34.164	7.6
Oxalic acid,............	6 *o*	1 *h*	4 *c*	66.534	0.244	33.222	22.

According to Gay-Lussac and Thenard.

	Carbon.	*Oxygen.*	*Hydrogen.*	
Wax, ...	81.79	5.54	12.67	
Olive oil, ...	77.21	9.43	13.36	
Copal, ...	76.81	10.61	12.58	
Rosin, ...	75.94	13.34	10.72	
Oak wood, ...	52.53	41.78	5.69	
Beech wood, ...	51.45	42.73	5.82	
Fecula, ...	43.55	49.68	6.77	
Sugar, ...	42.47	50.63	6.90	
Gum Arabic, ...	44.23	50.84	6.93	
Sugar of milk, ...	38.825	53.834	7.341	
Acetic acid, ...	50 22	44.15	5.63	
Citric acid, ...	33.81	59.86	6.33	
Tartaric acid, ...	24.05	69.32	6.53	
Mucous acid, ...	33.69	62.67	3.62	
Oxalic acid, ...	26.57	70.69	2.74	
				Nitrogen.
Gelatin, ...	47.881	27.207	7.914	16.998
Albumen, ...	52.883	23.872	7.540	15.705
Fibrin, ...	53.360	19.865	7.021	19.934
Cheese, ...	59.781	11.409	7.429	21.381

Ultimate Analysis of Vegetable Substances.—Dr Prout.

I. SUGARS.

	Carbon.	*Water.*
Pure sugar candy,	42.85	57.15
Impure sugar candy,	41.5 to 42.5	58.5 to 57.5
English refined sugar,	41.5 to 42.5	58.5 to 57.5
East India sugar candy,	41.9	58.1
——— refined sugar,	42.2	57.8
Maple sugar,	42.1	57.9
Beet root sugar,	42.1	57.9
East India moist sugar,	40.88	59.12
Sugar of diabetic urine,	36 to 40 ?	64 to 60 ?
——— Narbonne honey,	36.36	63.63
—— from starch,	36.2	63.8

II. STARCHES.

Wheat starch,	37.5	62.5
Arrow root,	36.4	63.6
Lignin, box,	42.7	57.3
——— willow,	42.6	57.4
Sugar of milk,	40.	60.
Manna sugar,	38.7	61.3
Gum Arabic,	36.3	63.7

III. VEGETABLE ACIDS.

			Oxygen.
Acetic acid,	47.05	52.95	00.00
Malic acid,	40.68	45.76	13.56
Citric acid,	34.28	42.85	22.87
Saclactic acid,	33.33	44.44	22.22
Tartaric acid,	32.	36.	32.
Oxalic acid,	19.04	42.85	38.11

Elementary Changes which Starch undergoes by malting and roasting.—Mr F. Marcet of Geneva.

	Starch raw,	*malted,*	*roasted.*
Carbon,	43.7	41.6	35.7
Oxygen,	49.7	51.8	58.1
Hydrogen,	6.6	6.6	6.2

Organic Acids according to Dr Thomson.

		Hydrog.	Carb.	Oxyg	
Oxalic, ...	— $2c+3o$	——	40	80.	
Formic, ...	$1h+2c+3o$	2.72	32.42	64.86	
Saclactic, ...	$2h+3c+4o$	3.84	34.61	61.55	
Acetic, ...	$2h+4c+3o$	4.	48.	48.	
Succinic, ...	$2h+4c+3o$	4.	48.	48.	
Citric, ...	$2h+4c+4o$	3 45	41.38	55.17	
Tartaric, ...	$2h+4c+5o$	3.03	36.36	60.61	
Benzoic, ...	$2h+5c+1o$	5.	75.	20.	
Uric, ...	— $6c+1o+2n$	——	50.	11.11	38.89 *Nitrogen.*

Table of the Solubility of Salts in 100 *parts of water, at*

Acids.	60°.	212°.
Arsenic, - - -	16.6	50.
Arsenious, - - -	1.25	6.
Benzoic, - - -	0.208	4.17
Boletic, - - -	0.55	
Boracic, - - -	2.8	8.
Camphoric, - - -	1.04	9.1
Chromic, - - -	unknown.	
Citric, Vauquelin, - -	133.	200.
Gallic, - - -	8.3	66.
Kinic, - - -	20.	
Laccic, - - - -	very soluble.	
Lactic, - - -	very soluble.	
Malic, - - -	very soluble.	
Mellitic, - - -	sparingly.	
Molybdic, - - -		0.1
Moroxylic, - - -	0.015	0.035
Mucic, saccholactic, - -	0.84	1.25
Oxalic, - - -	50.	100.
Phosphoric, - - -	20.	much more.
Rheumic, - - -	50.	
Suberic, - - -	1.25	2.63 at 140.
Succinic, - - -	4.	50.
Tartaric, - - -	very soluble.	
Tungstic, - - -	insoluble.	
Uric, - - -	0.0589	0.087
Zumic, - - -	very soluble.	

Salifiable Bases.

Potassa, (real) - - -	41.	56.5
Soda, (real) - -	more soluble than potassa.	
Lithia, - - -	very soluble.	
Baryta, crystallized, - - -	57.	watery fusion.
Strontia, crystallized, - -	19.2	50.

Lime, Mr Dalton, at 32° 0.15; 130° .103;	0.1287	0.0789
Magnesia, Dr Fyfe,	0.0194	0.00277

Salts.

Alum, ammoniacal, Dr Thomson,	9.37	
—— potash, ditto,	14.79	133.
—— soda, ditto,	327.6	
Ammonia, acetate,	very soluble.	
——— carbonate,		
——— sesquicarbonate,	50.	100.
——— bicarbonate,	decomposed.	
——— camphorate,	1.	33.
——— muriate,	33.	100.
——— phosphate,	15.	25.
——— phosphite,	50.	+
——— sulphate,	50.	100.
——— sulphite,	100.	
Antimony, (tartar emetic,)	D. 6.6	33.
Barium, chloride,	34.	59.
Baryta, acetate,	very soluble.	
—— carbonate,	insoluble.	
—— camphorate,	0.16	
—— chlorate,	25.	+
—— nitrate,	8.	25.
—— phosphate,	25.	+
—— phosphite,	0.25	
—— sulphate,	0.002	
Copper, acetate,	very soluble.	
—— sulphate,	25.	50.
Lead, chloride,	4.5	
—— acetate,	25.	+
—— sulphate,	0.08	
—— tartrate,	insoluble.	
Iron, sulphate,	50.	130.
—— muriate,	very soluble.	
Calcium, chloride,	400.	+
Lime, acetate,	very soluble.	
—— carbonate,	insoluble.	
—— camphorate,	0.5	
—— citrate,	insoluble.	
—— nitrate,	400.	
—— phosphate,	insoluble.	
—— sulphate,	0.2	0.22
—— sulphite,	0.125	
Lithia, corbonate,	1.0	
Magnesium, chloride,	100.	
Magnesia, acetate,	very soluble.	
——— carbonate,	0.04	0.0111
——— nitrate,	100.	+

Magnesia, phosphate,	6.6	
——— sulphate,	100.	644.
——— sulphite,	5.	
Mercury, bichloride,	5.	33.
——— chlorate,	25.	
Potassium, chloride,	34.	50.
Potass, acetate,	100.	
——— carbonate,	100.+	
——— bicarbonate,	25.	decomposed.
——— camphorate,	33.	+
——— chlorate,	5.9	40.
——— perchlorate,	2.	
——— ferrocyanate,	33.	100.
——— hydrocyanate,	very soluble.	
——— iodate,	7.5	
——— hydriodate,	very soluble.	
——— phosphate,	very soluble.	
——— phosphite,	33.	+
——— saccholactate,		12
——— sulphate,	6.25	20
——— bisulphate,	50.	100.+
——— sulphite,	100.	
——— superoxalate,		10.
——— supertartrate,	1.6	3.3
——— tartrate,	25.	
Silver, chloride,	0.08	
——— nitrate,	100.	
Sodium, chloride,	35.42	40
Soda, acetate,	very soluble.	
——— carbonate,	50.	100.+
——— bicarbonate,	much less.	decomposed.
——— borate (borax,)	5.	16.8
——— with bitartrate of potass,	20.	+
——— chlorate,	35.	+
——— ferrocyanate,	22.	+
——— hydriodate,	very soluble.	
——— nitrate,	33.	100.
——— phosphate,	25.	50.
——— saccholactate,		20.
——— sulphate,	37.	125.
——— bisulphate,	50.	
——— sulphite,	25.	100.
Strontian, chloride,	150.	unlimited.
——— acetate,		40.
——— carbonate,	insoluble.	
——— nitrate,	100.	200.
——— oxalate,	$0\frac{1}{19}$.	
——— phosphate,	insoluble.	
——— sulphate,	0.	0.02
Zinc, sulphate,	40.	+

Anomaly in the different Solubility of Salts at different Temperatures.

It was believed that the solubility of most salts increased with the increase of temperature. But Gay Lussac shewed that the solubility of sulphate of soda increased from 32° to 90°, when it reached its maximum, and then decreased to 218°, its boiling point. Afterwards Brandes found that the solubility of chloride of barium was still more anomalous, as it increases from 13° Fahr. to 122°, decreases to 145°, and again increases to its boiling point. I have ascertained a similar anomaly in nitrate of barytes, so that it is not improbable that it exists in regard to many salts. The following tables shew the progression of solubility in those salts in 100 parts of water.

Sulphate of Soda.

Dry,...	5.02	10.12	28.11	50.65	46.82	42.05
Crystallized,....	12.17	28.38	99.48	322.12	262.35	
Temp. Fahr. ...	32°	52°	76°	90°	122°	218°

Chloride of Barium.

Salt,....	39.6	42.2	43.7	51.	65.	48.	63.	65.	72.
Temp...	61°	68	72.5	100	122	145	167	190	212

Other Substances soluble in Water.

Sugars,—an equal weight at 60°, and any quantity at a boiling heat.
Mucilage, gum,—abundantly at 60°, but more so at 212°.
Starch,—insoluble at 60°, very soluble at 212°.
Vegetable jelly,—sparingly at 60°, very soluble at 212°.
Gelatine,—very soluble at 212°, gelatinizing at 60°.
Albumen, uncoagulated,—soluble at 60°, coagulating at 160°.
Fibrin, uncoagulated,—soluble at 60°, coagulating at 160°.
Urea,—very soluble.
Extractive, tannin,—very soluble.

Substances insoluble, or very sparingly soluble, in Water.

Earths and metallic oxides.
Chlorides of lead and mercury, (calomel).
Earthy and metallic carbonates.
Sulphates of baryta, strontia, and lime, and subsulphate of mercury.
Phosphates of baryta, strontia, lime, magnesia, and mercury.
Fluate of lime.
Subacetate of copper.
Subsalts in general.
Fixed oils.
Volatile oils.
Camphor.
Resins.
Caoutchouc.
Wax.
Suberin, lignin.

Table of the Solubility of Saline Substances in 100 *parts of Alcohol.*

Acid, boracic,	20 *at temperature*	176°
—— succinic,	74	
Ammonia, muriate,	7.	176
—— nitrate,	89.2	176
Alumina, muriate,	100	54
—— nitrate,	100	54
Cobalt, nitrate,	100	54
Copper, acetate,	7.5	176
—— muriate,	100	176
Iron, persulphate,	very soluble.	176
—— muriate,	100	176
Lime, muriate,	100	176
—— nitrate,	125	
Magnesia, muriate,	547	176
Mercury, muriate,	88.3	176
Potass, arseniate,	3.75	176
—— nitrate,	2.9	176
—— superoxalate,	3.	
—— tartrate,	0.04	
Soda, acetate,	46	176
—— arseniate,	1.7	176
Silver, nitrate,	41.7	176
Zinc, muriate,	100.	54

Other Substances very soluble in Alcohol.

All the acids except the sulphuric and nitric, which decompose it, and the phosphoric and metallic acids, which are insoluble.
All the alkalies, potass, soda, and ammonia.
All the alcaloids, morphia, cinchonia, quinia, strychnia, picrotoxia, &c.
All the alkaline soaps.
Sugar.
Most of the resins.
Castor oil. Elain.
Volatile oils.
Camphor.
Extractive, tannin.
Urea.

Substances insoluble in Alcohol.

Earths.
Metallic oxides.
Phosphoric and metallic acids.
Almost all the sulphates and carbonates.
The nitrates of lead and mercury.

The muriates of lead, silver, and soda.
The sub-borate of soda.
The tartrate of soda and potass, and the supertartrate of potass.
Fixed oils, wax and caoutchouc.
Earthy soaps.
Gum, starch, suber, lignin.
Gelatin, albumen, and fibrin.

Table of the Solubility of Fats in 100 *parts of Alcohol and Sulphuric Ether. By P. F. G. Boullay.*

	Alcohol, sp. gr. 0.828.		Ether.
	48 Fahr.	74 boiling.	48 Fahr.
Hogs lard,	1.04	1.74	25
Mutton suet,	0.69	1.39	10
Spermaceti,	1.39	8.33	20

Table of the Solubility of Fixed Fluid Oils in 100 *parts of Alcohol and Acetic Ether at* 55° *Fahr. By L. A. Planche.*

	Alcohol, sp. gr. 0.828.	Acetic Ether.
Castor oil,	every proportion.	800 and upwards.
Poppy seed oil, a year old,	0.8	
Linseed oil,	0.6	50.
Walnut oil,	0.6	50.
Poppy seed oil, new,	0.4	33.
Beech mast oil,	0.4	40.
Olive oil,	0.3	20.
Oil of sweet almonds,	0.3	25.
Oil of bitter almonds,	0.3	
Nut oil,	0.3	14

Proportion of Oil and Suet in various Fats according to Braconnot.

	Oil.	Suet.
Melted butter, summer,	60	40
——— winter,	35	65
Hogs lard,	62	38
Beef marrow,	24	76
Mutton marrow,	74	26
Goose grease,	72	32
Turkey grease,	74	26
Olive oil,	72	28
Oil of almonds,	76	24
——— colsa,	54	46

Table of Efflorescent Salts (Cadet de Vaux.)

288 grains of	in days	lost grains.
Sulphate of soda,	61	203
Phosphate of soda,	39	91
Carbonate of soda,	51	86

Table of Deliquescent Salts (Cadet de Vaux.)

288 grains of	in days	absorbed
Acetate of potass,	146	700
Muriate of lime,	124	684
——— manganese,	105	629
Nitrate of manganese,	89	527
——— zinc,	124	495
——— lime,	147	448
Muriate of magnesia,	139	441
Nitrate of copper,	128	397
Muriate of antimony,	124	388
——— alumina,	149	342
Nitrate of alumina,	147	300
Muriate of zinc,	76	294
Nitrate of soda,	137	257
——— magnesia,	73	207
Acetate of alumina,	104	202
Supersulphate of alumina,	121	202
Muriate of bismuth,	114	174
Superphosphate of lime,	93	165
Muriate of copper,	119	148

Table shewing the Proportion of Water of Crystallization in the Salts used in Pharmacy.

1. *Anhydrous.*

Ammonia, carbonate.
——— muriate.
——— tartrate.
Barytes, carbonate.
——— nitrate.
——— sulphate.
Copper, dicarbonate.
Lead, carbonate.
—— nitrate.
—— phosphate.
—— sulphate.
—— tartrate.
Lime, carbonate.
—— phosphate.
—— sulphate.
Iron, carbonate.
Magnesia, carbonate.
Mercury, subsesquicarbonate.
——— pernitrate.
——— phosphate.
——— persulphate.
——— tartrate.
Potash, nitrate.
——— sulphate.
Silver, carbonate.
—— nitrate.
—— sulphate.
Soda, nitrate.
—— oxalate.
Zinc, carbonate.

2. *One Atom of Water.*

Alumina, acetate.
Ammonia, sesquicarbonate.
——— bicarbonate.
——— nitrate.
Barytes, sulphate.
——— muriate.
Copper, acetate.
——— dicarbonate. Var. *b.*
Lead, hyponitrite.
Potash, binarseniate.
——— bicarbonate.
——— oxalate.
——— phosphate.
Soda, bicarbonate.
—— urate.
Zinc, carbonate.

3. *Two Atoms of Water.*

Ammonia, oxalate.
Bismuth, dinitrate.
Copper, trisacetate.
——— muriate.
Iron, tartrate.
Lime, sulphate.
Lead, trisacetate.
Magnesia, tartrate.
Mercury, nitrate.
——— sulphate.
Potash, acetate.
——— carbonate.
——— bisulphate.
——— tartrate.
——— bitartrate.
Soda, tartrate.
—— subsesquicarbonate.

4. *Three Atoms of Water.*

Alumina, muriate.
Bismuth, nitrate.
Copper, subsesquiacetate.
Iron, acetate.
Iron, muriate.
Potash, benzoate.
Magnesia, carbonate.
Tin, bimuriate.

5. *Four Atoms of Water.*

Lime, tartrate.
Mercury, acetate.

6. *Five Atoms of Water.*

Copper, sulphate.
Magnesia, acetate.
——— muriate.

7. *Six Atoms of Water.*

Copper, diacetate.
——— acetate.
——— muriate.
——— nitrate.
Magnesia, nitrate.
Potash, binacetate.
——— sesquicarbonate.
Soda, acetate.

8. *Seven Atoms of Water.*

Alumina, sulphate.
Ammonia, acetate.
Copper, nitrate.
Iron, nitrate.
—— sulphate.
Magnesia, sulphate.
Zinc, acetate.
—— sulphate.

9. *Eight Atoms of Water.*

Iron, persesquinitrate.
Soda, borate, (Borax.)
—— arseniate.

10. *Ten Atoms of Water.*

Lead, diacetate.
Soda, carbonate.
—— sulphate.

11. *Twelve Atoms of Water.*

Soda, phosphate.

Colour of the Precipitates thrown down from Metallic Solutions by various Re-agents. Dr Henry.

Metals.	Prussiated Alkalies.	Tincture of Galls.	Water impregnated with Sulphuretted Hydrogen.	Hydrosulphurets.
Antimony	White	A white oxide from dilution	Orange	Orange
Arsenic	White	Little change	Yellow	Yellow
Bismuth	White	Orange	Black	Black
Cadmium	White	No change	Orange	Orange
Cerium	White	Yellowish		Brown, becoming deep green
Chrome	Green	Brown		Green
Cobalt	Grass green	Yellowish-white	Not precipitated	Black
Columbium	Olive	Orange		Chocolate
Copper per salts	Bright reddish-brown	Brownish	Black	Black
Gold	White	Solution turned green. Precipitate brown of reduced gold	Yellow	Yellow
Iridium	None; colour discharged	None; colour discharged		
Iron 1 proto-salts	White changing to blue	No precipitate	Not precipitated	Black
Iron 2 per salts	Deep blue	Black		
Lead	White	White	Black	Black
Manganese	White	No precipitate	Not precipitated	White
Mercury	White changing to yellow	Orange-yellow	Black	Brownish-black
Molybdenum	Brown	Deep brown	Brown	
Nickel	Apple-green	Greyish white	Not precipitated	Black
Osmium		Purple changing to vivid blue		
Palladium	Olive *; deep orange †		Dark brown	Dark brown
Platinum	No precipitate; but orange by prussiate of mercury	Dark green, becoming paler	Precipitated in a metallic state	
Rhodium	No precipitate			No precipitate
Silver	White	Yellowish-brown	Black	Black
Tellurium	No precipitate	Yellow		Blackish
Tin	White	No precipitate	Brown	Black
Titanium	Reddish-brown	Reddish-brown	Not precipitated	Grass-green
Tungsten				
Uranium	Blood-red	Chocolate		Brownish-yellow
Zinc	White	No precipitate	Yellow	White

* Chenevix. † Wollaston.

Natural Classification of Vegetable Principles by Dr Brandes *, 1819.

Family I.

G. 1. Lignin.
2. Medullin, of John.
3. Cotton, of John.
4. Suberin, of Chevreuil.

Family II.

5. Starch.
6. Fibrous Starch, of Einhoff and Giese.
7. Inulin, of Funke, John and Giese.
8. Datiscin, of Braconnot.
9. Menyanthin, of Trommsdorf in the Menyanthes trifoliata.
10. Fungin, of Braconnot.

Family III.

11. Ulmin, of Klaproth.
12. Tragacanth, of Bucholz, Meissner and Brandes.
13. Bassorin, of Vauquelin.
14. Prunin, of John and Bostock.

Family IV.

15. Gum.
16. Mucus. Pfaff.

Family V.

17. Sugar.
    Species 1. Cane-sugar.
    2. Grape-sugar. Proust.
    3. Starch-sugar. Kirckhoff.
    4. Honey-sugar.
18. Mannite ? Bucholz.
19. Glycion. Robiquet.

Family VI.

20. Asparagin. Vauquelin, Robiquet.
21. Olivile. Pelletier.

Family VII.

22. Indigo. Chevreuil, Dobereiner.

Family VIII.

23. Jelly.
    Species 1. Vegetable jelly, in subacid fruits.
    2. Animal jelly. Fourcroy.
24. Gluten. Beccaria.

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* See Grundriss der Pharmacie mit vorzüglicher Hinsicht auf die pharmaceutische Chemie von C. F. Bucholz: aufs neue herausgegeben von Rudolph Brandes, W.W.D. 8vo, Erfurt, 1819.

25. Albumen. Fourcroy, Bucholz, Proust, Trommsdorff.
26. Vegeto-animal principle of pulse. Einhoff.
27. Pollenin. John.
28. Orlean from the Bixa orellana.

Family IX. Extractive principles.

29. Bitter extractive with slight agency.
30. Bitter extractive with great agency.
31. Aloesin. Trommsdorff, Pfaff, Braconnot.
32. Bitter narcotic extractive. Pfaff.
33. Scillitin. Vogel.
34. Emetin. Pelletier, Bucholz and Brandes.
35. Caffein. Chenevix, Paysse.
36. Erythrodenin. Bucholz, Dobereiner.
37. Cerein, (Polychroit.) Vogel, Bouillon La Grange.
38. Valerianin. Trommsdorff.
39. Tannin.

Family X.

SECTION I.—Uncrystallizable.

40. Rhabarbarin. Trommsdorff.

SECTION II.—Crystallizable.

41. Hæmatoxylin. Chevreuil.

Family XI.

42. Cinchonin. Duncan, Gomez.
    Species 1. Cinchonia. Pelletier.
    2. Quinia. Pelletier.

Family XII.

43. Daphin. Vauquelin.
44. Picrotoxia. Boullay.
45. Morphia. Sertuerner.
46. Strychnia.

Family XIII.

47. Fixed oils.
48. Vegetable butters.
49. Wax.
    Species 1. Cerin. John, Bucholz, Brandes.
    2. Myricin. John, Bucholz, Brandes.

Family XIV.

50. Resinoids. Gehlin.

Family XV.

51. Resins.
52. Balsams.

Family XVI.

53. Caoutchouc.

Family XVII.

SECTION I.—Fluid at common temperatures.

54. Volatile oils.

SECTION II.—Solid at common temperatures.

55. Camphor.
56. Anemonin. Heyer.
57. Inulin. Funke.

Family XVIII.

58. Narcotic principles.
59. Acrid principles.

It is evident that many additions, and some corrections, might be made; but it is transcribed without alteration, except in a single instance, to do justice to myself.

Classification of the Vegetable Materia Medica on Chemical Principles. By Prof. Pfaff of Kiel.*

Class i. Mucilaginous Medicines.

Order 1. Gums.

1. Gummi Arabicum et Senegalense.
2. Gummi tragacantha.

Order 2. Mucous Medicines.

3. Althææ radix et folia.
4. Cydoniorum semina.
5. Lini semina.
6. Malvæ herba et flores.
7. Fœni Græci semina.
8. Psylii semina.

Class ii. Amylaceous Medicines.

1. Amylum
2. Saga; grana.
3. Salep; radices.
4. Marantæ arundinaceæ amylum.
5. Hordei semina.

Class iii. Gelatinous Medicines.

1. Ichthyocolla.
2. Cornu cervi.
3. Helix pomatia.

Class iv. Saccharine Medicines.

1. Saccharum album.
2. Mel.
3. Manna.
4. Saccharum lactis.
5. Mellago graminis.

Class v. Sweet Extractive.

1. Glycyrrhizæ radix.
2. Graminis radix.
3. Dauci carotæ radix.
4. Cassia fistula.
5. Polypodii radix.

Class vi. Oleaginous Medicines.

A. Vegetable.

Order 1. Fluid at ordinary temperatures.

1. Oleum Olivarum.
2. Oleum amygdalæ.
3. Oleum lini.
4. Oleum papaveris albi.
5. Oleum ricini.
6. Oleum crotonis.

Order 2. Solid Oils. Stearin.

6. Cacao nuclei.
   a. Butyrum cacao.
   b. Chocolata.
7. Oleum baccarum lauri.
8. Oleum macis.

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* See System der Materia Medica nach chemischen Principien. v. Bände und Supplt. Leipzig, 1814-21.

B. Animal.

9. Axungia porci.
10. Sevum ovillum.
11. Oleum ovorum.

C. Adipocerous.

12. Spermaceti.

D. Waxy.

13. Cera.
    a. Flava.
    b. Alba.

Class vii. Bitter Extractive.

Order 1. With weak powers.

1. Quassiæ lignum et radix.
2. Gentiana rubra.
3. Centaurium minus.
4. Menyanthes trifoliata.
5. Carduus benedictus.
6. Fumaria officinalis.
7. Polygalæ amaræ radix et herba.
8. Leontodi taraxaci herba et radix.

Order 2. With strong power.

9. Colombæ radix.
10. Angusturæ veræ cortex.
11. Quassiæ simaroubæ cortex.
12. Lichen Islandicus.

Order 3. Of great intensity.

13. Nux vomica.
14. Faba S^ti Ignatii.
15. Angusturæ spuriæ cortex.

Class viii. Acrid Extractive.

1. Polygalæ Senegæ radix.
2. Saponariæ officinalis radix.

Class ix. Colouring Extractive.

1. Rubiæ tinctorum radix.

Class x. Astringent Principle.

1. Gallæ Turcicæ.
2. Catechu.
3. Kino.
4. Quercus cortex.
5. Tormentillæ radix.
6. Hæmatoxyli Campechiani lignum.
7. Cortex granatorum.
8. Flores balaustiorum.
9. Radix bistortæ.
10. Myrobalanæ.
11. Baccæ myrtillorum.
12. Symphitis majoris radix.
13. Lysimachiæ purpureæ herba et flores.
14. Rosarum rubrarum flores.
15. Ratanhiæ radix.
16. Caryophyllatæ radix.
17. Putamina nucum juglandum.
18. Uvæ ursi folia.

Class xi. Cinchonin and astringency intimately combined.

1. Cinchonæ officinalis cortex.
2. Cinchona flava.
3. Cinchona rubra.
4. Cinchona Caribœa.
5. Cinchona S^ti Luciæ.
6. Cinchona Pithou.
7. Cinchona nova.
8. Lichen parieitinus.
9. Cortex Cabarro Alcorinoco.

Class xii. Caffein.

1. Caffææ baccæ.

Class xiii. Rhabarbarin.

Rhæi radix.
Rhapontici radix.

Class xiv. Aloesin.

1. Aloes socotorina.
2. Aloes hepatica.

Class xv. Picromel.

1. Fel tauri.

Class xvi. Emetics.

1. Ipecacuanhæ radix.

Class xvii. Resinous.

Order 1. Indifferent Resins.

1. Lacca.
2. Sanguis draconis.
3. Resina communis.
4. Colophonium.

Order 2. Aromatic Resins.

5. Sandarac.
6. Mastiche.
7. Olibanum. Thus.
8. Elemi.
9. Tacamahaca.

Order 3. Balsamic Resins.

10. Benzoes.

11. Storax.

Order 4. Guaiacin.

12. Guaiac.

Order 5. Purging resins.

13. Jalapæ radix.
14. Scammonium.
15. Agaricus albus.
16. Gratiolæ officinalis herba.

Allied.

17. Sennæ folia.
18. Bryoniæ albæ radix.
19. Colocynthides.
20. Momordica Elaterium.

Order 6. Acrid Resins.

A. Strictly Acrid Resins.

21. Euphorbium.
22. Piper nigrum et album.
23. Capsicum annuum.
24. Daphnes Mezerei cortex et baccæ.
25. Pyrethri veri radix.
26. Arnicæ montanæ flores, herba et radix.
27. Asari Europæi radix.

B. Cantharidin.

28. Cantharides.
29. Lytta vittata et cœrulea.

C. Helleborin.

30. Hellebori nigri radix.
31. Hellebori hyemalis radix.

Class xviii. Gum Resins.

A. Containing volatile oil.

1. Gummi ammoniacum.
2. Assafœtida.
3. Galbanum.
4. Sagapenum.
5. Myrrh.
6. Opoponax.

B. Containing no volatile oil.

7. Gummi guttæ.
8. Chelidonii majoris herba.

Class xix. Natural Resinous Juices.

Order I. Fluid resins.

1. Copaiva.
2. Terebinthina vulgaris.
3. Terebinthina Veneta.
4. Balsamum Meccæ.
5. Balsamum Canadense.
6. Pistacia Terebinthus.

Addition.

7. Pix liquida.

Order 2. Resinous Juices, with benzoic acid.

8. Balsamum Peruvianum.
9. Balsamum Tolutanum.
10. Storax liquida.

Class xx. Volatile Oils.

Order I. Substances with an odorous principle analogous to volatile oil.

1. Flores violarum.
2. Convallariæ majalis flores.
3. Flores tiliæ.
4. Flores verbasci.
5. Flores sambuci.
6. Flores pruni spinosæ.

Order 2. Containing a true volatile oil.

A. Camphoraceous oils.

7. Oleum cajeputi.
8. Cardamomum minus.
9. Cubebæ.
10. Calami aromatici radix.
11. Zedoariæ radix.
12. Zingiberis radix.
13. Galangæ radix.
14. Rorismarini herba et flores.
15. Salviæ herba.
16. Hysopi herba.
17. Menthæ piperitæ herba.
18. Menthæ crispæ herba.
19. Lavandulæ flores.
20. Majoranæ herba.
21. Origani vulgaris herba.
22. Mari Syriaci herba.
23. Serpentariæ Virginianæ radix.
24. Valerianæ radix.

Cinnamon flavour.

25. Cassiæ cortex.
26. Cinnamomi cortex.

27. Cassiæ flores.

Clove flavour.

28. Caryophilli aromatici.
29. Canellæ albæ cortex.
30. Winteræ aromaticæ cortex.
31. Pimento.
32. Costus Arabicus.

Nutmeg flavour.

33. Nux moschata.
34. Macis.

Anise flavour.

35. Anisi vulgaris semina.
36. Anisi stillati semina.
37. Fœniculi semina.
38. Fœniculi radix.
39. Angelicæ radix.
40. Sassafras.

Vanille flavour.

41. Vanillæ siliqua.
42. Carscarillæ cortex.

Lemon flavour.

43. Citri cortices.
44. Aurantiorum Curassaviensium cortices.
45. Melissæ herba.
46. Serpylli herba.

Rose flavour.

47. Flores rosarum pallidarum.
48. Lignum Rhodii.

Violet flavour.

49. Iridis florentina radix.

Saffron flavour.

50. Crocus.

Caraway flavour.

51. Carui semina.
52. Cumini semina.
53. Nigellæ sativæ semina.
54. Phellandrii aquatici semina.
55. Petroselini semina.

Turpentine flavour.

56. Oleum terebinthinæ.
57. Sabinæ folia.
58. Juniperi baccæ.

Chamomile flavour.

59. Chamomillæ vulgaris flores.
60. Millefolii flores et herba.

Tansy flavour.

61. Tanaceti herba, flores et semina.
62. Absinthium vulgare.
63. Ruta vulgaris.
64. Semen santonici.

Pungent from sulphuretted hydrogen.

65. Allii radix.
66. Cepæ radix.
67. Cochleariæ armoraciæ radix.
68. Cochleariæ herba.

Ratafia flavour.

See Narcotics.

Elecampane flavour.

69. Inulæ helenii radix.

Strong smelling animal substances.

70. Castoreum.
71. Moschus.
72. Ambra grisea.

Class xxi. Camphor.

1. Camphora ex lauro.
2. Camphora ex oleis volatilibus.

Class xxii. Anemonin.

1. Pulsatillæ nigricantis herba.

Class xxiii. Narcotic Principle.

Order 1. Without evident acrimony.

Section 1. Depending upon an alkaline principle.

1. Opium.

Section 2. Depending upon narcotic extractive.

2. Conium maculatum.
3. Hyosciamus niger.
4. Datura stramonium.
5. Atropa belladonna.
6. Lactuca virosa, sativa.
7. Dulcamaræ stipites.

Order 2. With evident acrimony.

8. Nicotiana tabacum.
9. Digitalis purpurea.
10. Aconitum napellus.
11. Cicuta aquatica.
12. Chærophyllum sylvestre.
13. Rhododendron chrysanthum.
14. Ledum palustre.

Class xxiv. Containing prussic acid.
1. Pruni laurocerasi folia.
2. Amygdalæ amaræ.
3. Persicæ flores, folia et nuclei.
4. Cerasorum nuclei.
5. Acaciarum flores.
6. Pruni padi cortex.

Class xxv. Containing an acrid principle, not volatile oil.
1. Colchici radix.
2. Scillæ radix.
3. Ari radix.
4. Flammulæ Jovis herba.
5. Clematidis vitalbæ herba.
6. Chelidonii minoris radices.
7. Rhois toxicodendri folia.

Classification of Pharmaceutical Processes and Forms of Medicines, by MM. Henry and Guibourt.

Pharmacy consists of four parts.

I. The knowledge of simples, or Pharmaceutical Natural History.

II. The collection of simples, including,
1. The selection,
2. The cleaning, and
3. The drying of
    - *a* Roots,
    - *b* Bulbs and buds,
    - *c* Twigs, woods and barks,
    - *d* Leaves and summits,
    - *e* Flowers,
    - *f* Fruits and seeds,
    - *g* Vegetable products,
    - *h* Animals.

III. The preparation of medicines, of which the processes are,
1. Division, performed in seven ways,
    - *a* Extinction,
    - *b* Granulation,
    - *c* Section,
    - *d* Rasion,
    - *e* Quassation,
    - *f* Epistation,
    - *g* Pulverization.
2. Extraction, comprehending eighteen operations.
    - *a* Assation,
    - *b* Torrefaction,
    - *c* Fusion,
    - *d* Sublimation,
    - *e* Distillation,
    - *f* Solution,
    - *g* Lotion,
    - *h* Lixiviation,
    - *i* Maceration,
    - *k* Digestion,
    - *l* Infusion,
    - *m* Decoction,
    - *n* Immersion,
    - *o* Expression,
    - *p* Clarification,
    - *q* Evaporation,
    - *r* Crystallization,
    - *s* Congelation.
3. Mixture, which is performed
    - *a* by the aid of balances to determine the weight of the ingredients,
    - *b* by the aid of vessels to complete the mixture.

4. Combination or chemical action. The operations are,
   - *a* Dissolution,
   - *b* Precipitation,
   - *c* Effervescence,
   - *d* Carbonization,
   - *e* Combustion,
   - *f* Calcination,
   - *g* Ignition,
   - *h* Reduction,
   - *i* Compound fusion,
   - *k* Compound sublimation,
   - *l* Compound distillation,
   - *m* Gazification,
   - *n* Fermentation.

IV. Preservation or storing up.

Systematic View of the Preparations of Pharmacy, by MM. Henry and Guibourt, with the modern French Nomenclature.

Medicines are prepared,

I. By division.	
	Simple powders.
	Pulps.
II. By extraction.	
	Fæcula.
	Watery juices.
	Oily juices and fats.
	Extracts.
	Resins.
	Volatile oils.
	Purified solvents, and salts.
III. By mixture.	
a Without excipient.	
	Species.
	Compound powders.
b With a variable excipient or none.	
	Pills.
	Troches.
c With a determinate excipient.	
1. Sugar or honey, σακχαρ,	Solid *Saccharolés.*
	Soft do.
	Liquid do.
2. Water, ὕδωρ, by distillation,	*Hydrolats.*
by solution,	*Hydrolées.*
3. Wine, οινος, - -	*Œnolés.*
4. Beer, βρυτον, - -	*Brutolés.*
5. Vinegar, οξυς, - -	*Oxeolés.*
6. Alcohol by distillation, -	*Alcoholats.*
by solution,	*Alcoholés.*
7. Ether, - - -	*Etherolés.*
8. Volatile oil, μυρον, -	*Myrolés.*
9. Fixed oil, ελαιον, - -	*Elæolés.*
10. Fat, λιπος, - -	*Liparolés.*

11. Resin, ϱετινη, - -	*Retinoles.*
12. Oleo-stearite of lead, -	*Stearatés.*
IV. By combination, or chemical action.	
1. Simple or elementary bodies.	
2. Binary compounds, -	*Oxiques.* *Azotiques.* *Chloriques.* *Iodiques.* *Sulphuriques.*
3. Ternary compounds. -	*Azocarbiques, or* *Cyaniques.* Double oxides. Vegetable acids. Ethers.
4. Quaternary and quinary compounds,	Salts with vegetable acids. Vegetable alkalies. Empyreumatic organic products.

Buchner's Classification of Forms of Medicines procured by Operations of the First Degree *.

Combination.	*Separation.*
Solutions.	Infusions.
Mucilages.	Decoctions.
Emulsions.	Infused Decoctions.
Mixtures.	Boiled Infusions.
Drops.	Tinctures.
Draughts.	Essences.
Tinctures.	Elixirs.
Juleps.	Wines.
Gargles.	Vinegars.
Eye-waters.	Solutions in Oil.
Fomentations.	Distilled Waters and Spirits.
Washes.	Robs.
Injections.	Extracts.
Honeys.	Pulps.
Syrups.	Jellies.
Salves.	Resins.
Cerates.	Volatile Oils.
Balsams.	
Liniments.	
Plasters.	
Soaps.	

Operations of the Second Degree.

Via humida.

Solution—Deliquescence—Mixture—Neutralization—Evaporation—Distillation—Evolution of gas—Rectification—Crystallization—Precipitation—Coagulation—Efflorescence—Fermentation.

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* Vollständigen Inbegriff der Pharmacie in ihren Grundlehren und praktischen Theilen, 8vo, Nurnberg, 1821.

Via sicca.

Trituration — Incandescence —Fusion—Detonation—Sublimation Ustulation—Charring—Dry distillation—Incineration.

List of Simples to be collected, and Operations to be performed, in each month of the year by the Pharmaceutists in Paris. From Henry and Guibourt.

JANUARY.

Lichen Pulmonarius.

In this month there is little to be collected, only some antiscorbutic plants for extemporaneous preparations, those for officinal preparations having been already gathered in a more propitious season. The surface of the ground is often frozen, and there are no leaves to indicate where the wild roots are to be found. Jujubes, dates, raisins and new figs are brought to Paris.

N. B. The apothecary takes advantage of the leisure thus afforded to him to attend to chemical operations, especially those which require a low temperature, such as the preparation of the ethers, and of liquid ammonia.

FEBRUARY.

This month does not furnish us with any indigenous plant, except towards the end, when the winter has been very mild. Cultivated violets may be sometimes got, but in general they do not appear till the next month.

MARCH.

Buds of the
Populus nigra, (also in April).
Herbs of the
Ficaria ranunculoides.
Flowers of the
Cheiranthus Cheiri, (and in April.)
Amygdalus Persica, (and in April.)
Vinca major.
Primula veris, (and in April.)
Tussilago Farfara.
Viola odorata.

APRIL.

Fungus rosaceus.
Leaves of the
Asarum Europæum.
Atropa Mandragora.
Ranunculus bulbosus.
Flowers of the
Narcissus pseudo-narcissus.
Lamium album.
Gnaphalium dioicum.

MAY.

Herbs of
Artemisia Absinthium, (first cutting.)
Actæa spicata.
Anemonè Pulsatilla.
Erysimum Alliaria.
Amaranthus Blitum.
Veronica Beccabunga.
Cicuta major, (La Marck.)
Cochlearia officinalis.
Sisymbrium Nasturtium.
Eupatorium cannabinum.
Glecoma hederacea.

Pulmonaria officinalis.
Potarium Sanguisorba.
Flowers of the
Convallaria Maialis.
Viola tricolor, (cultivated variety.)
Rosa pallida.
Rosa Gallica. } Sometimes towards the end of the month.
Catkins of the
Juglans regia.

JUNE.

Leaves and summits of the
Apium graveolens.
Anethum graveolens.
Angelica Archangelica, (and July.)
Artemisia vulgaris.
——— Abrotanum.
Asarum Europæum.
Lappa major.
Atropa Belladona.
Betonica officinalis.
Borago officinalis.
Ajuga reptans.
Anchusa officinalis.
Adiantum capillus veneris.
Asplenium Trichomanes.
Centaurea Centaureum.
Centaurea Jacea.
Teucrium Chamædrys,
Ajuga Chamæpitys,
Cnicus benedictus, } and July.)
Calcitrapa stellata.
Silybum marianum.
Cichorium Intybus.
Digitalis purpurea, (first cutting. There is a second cutting in September, but the first is the best.)
Cuscuta Epithymum.
Euphorbia Lathyris.
Erysimum officinale.
Euphrasia officinalis.
Anethum Fœniculum.
Spiræa Filipendula.
Fumaria officinalis.
Galium luteum, (and July.)
Geranium Robertianum.
Althæa officinalis.
Sempervivum tectorum.
Hyosciamus niger.
Lactuca virosa.
Marrubium vulgare.
Lysimachia nummularia.
Parietaria officinalis.
Vinca major.
Taraxacum dens leonis.
Plantago media.
Rubus fruticosus.
Saponaria officinalis.
Scabiosa arvensis.
Veronica officinalis.
Verbena officinalis.
Flowers of the
Anchusa officinalis.
Papaver Rhœas.
Chamæmelum vulgare.
Spartium Scoparium.
Lilium album.
Matricaria parthenium.
Citrus aurantium, (and July.)
Gnaphalium dioicum.
Achillea Ptarmica.
Rosa pallida.
Rosa moschata.
Rosa Gallica.
Sambucus nigra.
Calendula officinalis.
Cerasus domestica,
Rubus idæus,
Fragaria vesca,
Ribes rubrum, } (and July.)
Juglans regia.

JULY.

Leaves and summits of the
Artemisia Absinthium, (a second cutting.)
Agrimonia Eupatoria.
Potentilla anserina.
Ballota nigra.
Ocymum basilicum.
Chenopodium bonus Henricus.
Melissa Calamintha.
Nepeta Cataria.
Clematis Vitalba.
Erythræa Centaureum.
Chelidonium majus.
Cuscuta Europæa.
Euphorbia Cyparissias.

Euphorbia Peplus.
Eupatorium Cannabinum.
Gratiola officinalis.
Hyssopus spicata, (and August.)
Origanum Majorana.
Teucrium Marum.
Malva sylvestris.
Melissa officinalis.
Melilotus officinalis.
Mentha crispa.
Mentha piperita, (and August.)
——— Pulegium.
Achillea Millefolium.
Hypericum perforatum.
Nicotiana Tabacum, (and August.)
Origanum vulgare.
Sedum Telephium.
Salvia Sclarea.
Lepidium latifolium.
Alchemilla vulgaris.
Polygonum Persicaria.
Ranunculus acris.
Rosmarinus officinalis.
Drosera rotundifolia.
Ruta graveolens.
Juniperus Sabina.
Lythrum Salicaria.
Sanicula Europæa.
Salvia officinalis.
Scolopendrium officinarum.
Teucrium Scordium.
———— Scorodonia.
Scrophularia nodosa.
Sedum acre.
Senecio vulgaris.
Rhus Coriaria.
Tanacetum vulgare.
Thymus vulgaris.
Spiræa ulmaria.
Chenopodium vulvaria.
Flowers of the
Cyanus segetum.
Borago officinalis.
Caprifolium Germanicum.
Lavandula Spica.
Malva sylvestris.
Dianthus Caryophyllus ruber.
Pæonia officinalis.
Lamium album.
Scabiosa arvensis.
Calendula officinalis.
Tilia Europæa.
Solidago Virgo Aurea.
Fruits and seeds of the
Ribes nigrum.
Cerasus domestica.
Daucus Carota.
Rubus idæus.
Fragaria vesca.
Ribes rubrum.
Lupinus albus.
Cerasus avium.
Juglans regia.
Ervum Ervilia.
Papaver somniferum album.
——————— nigrum.
Apium Petroselinum.
Plantago Psyllium.
Thlaspi arvense.
Viola odorata.

AUGUST.
Barks of the
Sambucus nigra.
Leaves and summits of the
Atropa Belladona.
Menyanthes trifoliata.
Solarium nigrum.
Ruta graveolens.
Datura Stramonium.
Herniaria glabra.
Flowers of the
Verbascum Thapsus.
Punica Granatum.
Althæa officinalis.
Humulus Lupulus.
Fruits and seeds of the
Sison Ammi.
Carum Carui.
Coriandrum sativum.
Cucumis sativus, (and Sept.)
Ecbalium Elaterium.
Daucus Carota.
Hyoscyamus albus.
Cucumis Melo.
Morus nigra.
Juglans regia.

SEPTEMBER.
Mercurialis annua.

Fruits and seeds of the
Physalis Alkekengi.
Berberis vulgaris.
Rosa canina.
Rhamnus catharticus.
Corylus Avellana.
Pepo macrocarpus.
Sambucus nigra.
——— Ebulus.
Roots of the
Angelica Archangelica.
Aristolochiæ.
Ononis spinosa.
Arum maculatum.
Asarum Europæum.
Asclepias Vincetoxicum.
Asparagus officinalis.
Polygonum Bistorta.
Calamus aromaticus.
Arundo Donax.
Chelidonium majus.
Cichorium Intybus.
Cynodon dactylon et Triticum repens.
Veratrum album.
Helleborus niger.
Anethum Fœniculam.
Spiræa Filipendula.
Aspidium filix mas.
Althæa officinalis.
Iris germanica.
Nymphæa alba.
Orchis mascula.
Rumex acetosa.
Cyclamen Europæum.
Rumex acutus.
Apium Petroselinum.
Ruscus aculeatus.
Pæonia officinalis.
Polypodium vulgare.
Solanum tuberosum.
Potentilla reptans.
Cochlearia armoracia.
Glycyrrhiza glabra.
Saxifraga granulata.
Scrophularea nodosa.
Tormentilla erecta.
Valeriana sylvestris.
New honey and yellow wax.

OCTOBER.
Brassica oleracea rubra.
Viscum album.
Juniperus communis.
Barks of the
Quercus Robur.
Daphne gnidium.
Æsculus Hippocastanum.
Ulmus campestris.
Juniperus communis.
Cydonia vulgaris.
Fagus sylvatica.
Juglans regia.
Pæonia officinalis.
Malus communis.
Vitis vinifera.
Ricinus communis.
Roots of the
Inula Helenium.
Lappa major.
Bryonia alba.
Eryngium campestre.
Calcitrapa stellata.
Symphytum Consolida.
Cynoglossum officinale.
Fragaria vesca.
Rubia tinctorum.
Imperatoria Ostruthium.
Rheum Rhaponticum.
Rheum palmatum.

In this month the shooting of game is permitted, so that the fats and marrows of various animals may be procured. The snails also shut in their shells to protect them from the cold, and are better than at any other time. The saffron of Gatinais, and the pomegranates of Provence come to Paris.

NOVEMBER AND DECEMBER.

In these months vegetation ceases; the leaves and dry stalks of vegetables are scattered by the winds, or buried in the snow, so as to make it useless to search for roots at so late a season. The agaric of the oak, however, may be found, as also quinces and juniper berries in the first fortnight of November. The new manna comes to Paris, and about the middle of December the oranges and lemons.

Pharmaceutical Calendar for the Climate of Weimar, by Göttling, shewing the principal Objects which the Apothecary has to attend to in each month of the year.

JANUARY, FEBRUARY.—The concentration of vinegar by freezing.
Muriate of antimony,
Ethers, dulcified spirits,
Dippel's animal oil to be prepared;
Some gum-resins, as assafœtida, galbanum, ammoniac, &c. to be powdered.

MARCH.—Mezereon bark,
Misleto of the oak to be gathered;
Conserve of scurvy-grass to be prepared.

APRIL.—Spirit of scurvy-grass,
Syrup of violets to be prepared.

MAY.—Sloe flower water,
Conserve of sorrel,
Plaster of henbane,
Extracts of succory, henbane, grass, dandelion, &c.
Oil of beetles, (Meloë majalis et proscarabæus,)
Spirit of ants, earthworms, &c.

JUNE.—Distilled water of lily of the valley,
Various distilled spirituous waters,
Conserves of various herbs and flowers, as conserve of roses, &c.
Hemlock plaster,
Extracts of hemlock, fumitory, wild lettuce, aconite, &c.

JULY.—Vinegar of roses,
Rose water,
Marjoram butter,
Preserved cherries, walnuts, currants, &c.
Extract of Elaterium,
Honey of roses,
Boiled oil of Hypericum,
Distilled oil of rosemary, mint, parsley, pennyroyal, wild thyme, &c.
Syrup of cherries, raspberries,
Spirit of rosemary.

AUGUST.—Cherry water.
Extract of blessed thistle, thorn apple, &c.
Boiled oil of wormwood, chamomile, &c.
Distilled oil of wormwood, chamomile, peppermint, millefoil, rue, &c.
Rob and syrup of mulberries.

SEPTEMBER.—Quince cinnamon water,
Oxymel of meadow saffron,
Quince cakes,
Syrup of barberries, quince, buckthorn,
Tincture of steel, with quince juice.

OCTOBER.—Tincture of steel, with apple juice.

NOVEMBER and DECEMBER.—As in January.

List of Officinal Plants in the British Pharmacopœias, arranged according to the Natural Orders.

IN this list I have followed the system adopted by M. De Candolle in his Essay on the Medical Properties of Plants, as that best adapted for the purpose.

Of the various principles upon which the numerous articles of the vegetable Materia Medica may be considered in a course of Lectures, the classification, according to a Natural Botanical Arrangement, seems to me to possess many advantages. It not only is the most suitable for combining in one discourse the natural, medicinal, and pharmaceutical history of each vegetable, but, by the great similarity which exists in these respects among the individuals forming each family, much repetition is avoided, while a great deal of information can be easily given concerning articles, which, though not officinal in this kingdom, are possessed of virtues that render them valuable in other countries, and may lead to their introduction into more general use. Accordingly, Professor Murray, of Göttingen, in his celebrated *Apparatus Medicaminum* [*], followed the natural arrangement of Linnæus; and modifications of that of Jussieu have been adopted by De Candolle * and Richard †.

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[*] Apparatus Medicaminum tam simplicium quam præparatorum et compositorum in praxeos adjumentum consideratus. Auctore Jo. Andrea Murray. 8vo. Gottingæ. Vol. i. 1776, pp. 627. Vol. ii. 1779, pp. 465. Vol. iii. 1784, pp. 572. Vol. iv. 1787, pp. 665. Vol. v. 1790, pp. 604. Vol. vi. post mortem auctoris edidit L. C. Althof, 1792, pp. 243, cum indice generali. Professor Althof also published a new edition of the two first volumes, Vol. i. 1793, pp. 964, Vol. ii. 1794, pp. 628.

On the present occasion I have confined myself to the plants officinal in the British Pharmacopœias as those of most importance to British practitioners, reserving to a future opportunity the publication of a general list, for which my collections, although considerable, are not complete.

The abbreviations in Roman Capitals after the name of the plant, (L. E. D.), refer to the London, Edinburgh, and Dublin Pharmacopœias. The Italic Capitals which follow, *W*, *R*, *B*, *H*, refer,—*W*, to Woodville's Medical Botany ‡; *R*, to the Phytographie Medicale of M. Roques §; *B*, to Bigelow's American Medical Botany ‖; and *H*, to Hayne's large work ¶, in one or other of which the plants are figured. The two late English works on Medical Botany I have referred to only when there were no figures in any of the others **.

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* Essai sur les Proprietés Médicales des Plantes, comparées avec leurs formes exterieures et leur classification naturelle. Par M. Aug. Pyr. De Candolle, 2de edition, revue et augmentée, pp. 397. 8vo. Paris, 1816.

† Botanique Médicale, ou Histoire Naturelle et Médicale des Médicamens, des Poisons, et des Alimens, tirés du Règne Végétal. Par Achille Richard, M. D., pp. 817. 8vo. Paris, 1823.

‡ Medical Botany, containing Systematic and General Descriptions, with plates of all the medicinal plants, indigenous and exotic, comprehended in the catalogues of the Materia Medica, as published by the Royal College of Physicians of London and Edinburgh, accompanied with a circumstantial detail of their medicinal effects, and of the diseases in which they have been most successfully employed. By William Woodville, M. D. of the Royal College of Physicians London, in three volumes 4to. London, 1790. Pp. 578.

A Supplement to the Medical Botany, or Part the Second, containing plates, with descriptions of most of the principal medicinal plants not included in the Materia Medica of the Collegiate Pharmacopœias of London and Edinburgh. 4to. London, 1794. Pp. 169. Plates in both works, 274.

§ Phytographie Médicale, ornées de figures coloriées de grandeur naturelle, où l'on expose l'histoire des poisons tirés du Règne Végétal, et les moyens de remédier à leurs effets délétères, avec des observations sur les propriétés et les usages des plantes heroïques. Par Joseph Roques, Docteur en Médecine. Tomes ii. royal quarto. à Paris, 1821. Pp. 304 and 328. Plates, 180.

‖ American Medical Botany; being a collection of the native medicinal plants of the United States, containing their botanical history and chemical analysis, and properties and uses in medicine, diet and the arts, with coloured engravings. By Jacob Bigelow, M. D. 3 vols. royal 8vo. Boston, 1817–18–20. Pp. 197, 199, and 193. Plates in all 60.

¶ Getreue Darstellung und Beschreibung der in der Arzneykunde gebräuchlichen Gewächse, wie auch solcher welche mit ihnen verwechselt werden können. Von Friedrich Gottlob Hayne. Berlin. Royal 4to. Erster Band, 1805; ii. 1809; iii. 1813; iv. 1816; v. 1817; vi. 1819; vii. 1821; viii. 1822; ix. 1825; x. 1827; first part of vol. xi. 1828; having 48 plates and 96 pages of letterpress in each volume.

Plantes usuelles des Brasiliens; par M. Auguste de Saint-Hilaire. 4to. Paris, 1824–1828. I have seen 14 numbers, containing in all the descriptions and figures of 70 plants.

** Medical Botany; or Illustrations and Descriptions of the Medicinal Plants of the London, Edinburgh, and Dublin Pharmacopœias, with those lately in-

In a few instances where the figures have not yet been copied into any systematic work, I have quoted the original authorities.

DICOTYLEDONES.

RANUNCULACEÆ.—*Acrid, narcotic, purgative, emetic.*

Aconitum Napellus, L. E.—A. paniculatum, D.—*W.* 6, *R.* 129.

Delphinium Staphisagria, L. E. D.—*W.* 154, *R.* 128.

Helleborus niger, L. E. D.—*W.* 18, *R.* 124, *H.* i. 78.

——— fœtidus, L.—*W.* 19, *R.* 126, *H.* i. 10.

Ranunculus acris, D.—*W.* 246.

——— Flammula, D.—*M. B.* 82.

MAGNOLIACEÆ.—*Stimulant; aromatic.*

Wintera aromatica, E.—Drymis aromatica, D.—Drymis Winteri, *H.* ix. 6.

MENISPERMEÆ.—*Bitter; narcotic.*

Menispermum Cocculus, E. D.—*R.* 145.—Cocculus suberosus, De Candolle.

Colomba; L. E. D.—Menispermum palmatum, *H.* ix. 48.—Cocculus palmatus, De C.

MALVACEÆ.—*Mucilaginous; demulcent.*

Malva sylvestris, L. E.—*W.* 54, *H.* ii. 28.

Althæa officinalis, L. E. D.—*W.* 53, *H.* ii. 25.

SIMARUBEÆ.—*Bitter, tonic.*

Quassia excelsa, L. E. D.—Simaruba excelsa, *H.* ix. 16.

——— Simaruba, L. E. D.—*W.* 77.—Simaruba amara, *H.* ix. 15.

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troduced into Medical Practice; comprising their generic and specific characters; English, provincial and foreign appellations; a copious list of synonymes; botanical descriptions; natural history; physical, chemical, and medical properties and uses; including also a popular and scientific description of Poisonous Plants, particularly those that are indigenous to Great Britain and Ireland; with figures coloured from nature; the whole forming a complete system of Vegetable Toxicology and Materia Medica. By John Stephenson, M. D. Graduate of the University of Edinburgh; and James Morss Churchill, F. L. S. Member of the Royal College of Surgeons, and Fellow of the Medico-Botanical Society of London. Royal 8vo. Lond. 1827, &c. 34 parts published.

Flora Medica; containing Botanical Descriptions, Natural History, Chemical Properties and Analysis, Medical Properties and Uses, &c. &c. &c.: the number of the different species of the Officinal Plants, comprised in the latest editions of the London, Edinburgh, and Dublin Pharmacopœias; a list of the Indigenous Plants possessing Medicinal Properties, not included therein; a separate list of the Poisonous Plants; an explanation of the classes and orders of the Sexual System of Linnæus, illustrated with coloured delineations; a copious list of Botanical Terms and Definitions; a Tabular Index, showing at one view the generic and specific name of each plant, the class and order to which it belongs in the sexual system of Linnæus, the natural order of Linnæus and Jussieu, its medicinal properties, and the volume and page in which the description is given. Edited by a Member of the London College of Physicians, F. L. S. and assisted by several Members of a Botanical Society. 8vo. Lond. 1827, 25 parts.

RUTACEÆ.—*Stimulant.*
a. *Zygophylleæ.*
Guaiacum officinale, L. E. D.—*W.* 16, *R.* 147.
b. *Rutaceæ veræ.*
Ruta graveolens, L. E. D.—*W.* 37, *R.* 146, *H.* vi. 8.
c. *Diosmeæ.*
Diosma crenata, D[*].
d. *Cuspariæ.*
Bonplandia trifoliata, E. D.—Cusparia febrifuga, L.—*R.* 143, *H.* i. 18.
CARYOPHYLLEÆ.—*Fragrant.*
Dianthus Caryophyllus, E. D.—*W.* 80.
LINEÆ.—*Mucilaginous, oily, bitter, cathartic.*
Linum usitatissimum, L. E. D.—*W.* 3, *H.* viii. 17.
——- catharticum, E.—*H.* viii. 18.
VIOLACEÆ.—*Fragrant, emetic.*
Viola odorata, E. D.—*W.* 81, *H.* iii. 2.
HESPERIDEÆ.—*Rind aromatic; juice acidulous.*
Citrus aurantium, L. E. D.—*W.* 183.
——- medica, L. E. D.—*W.* 184.
MELIACEÆ.—*Aromatic, astringent.*
Canella alba, L. E. D.—*W.* 117, *H.* ix. 5.
Swietenia Mahagoni, E.—*W.* 235, *H.* i. 19.
SARMENTACEÆ.—*Fruit sweet, sub-acid.*
Vitis vinifera, L. E. D.—*W.* 195, *H.* x. 40.
GERANIACEÆ.—OXALIDEÆ.—*Acid.*
Oxalis Acetosella, L.—*W.* 20, *H.* v. 39.
GUTTÆFERÆ.—*Resinous, purgative.*
Stalagmitis cambogioides, L. E. D.[†]
Dryabalonops Camphora, D.[‡]
CRUCIFERÆ.—*Volatile pungency, stimulant.*
Siliquosæ.
Cardamine pratensis, L. E. D.—*W.* 30, *H.* v. 30.
Sinapis alba, E. D.—*H.* vii. 39.
——— nigra, L. D.—*W.* 151, *R.* 139, *H.* viii. 40.
Sisymbrium Nasturtium, E.—*W.* 48, *H.* v. 32.
Siliculosæ.
Cochlearia Armoracea, L. E. D.—*W.* 150, *H.* v. 29.
——— officinalis, D.—*W.* 29. *H.* v. 28.
PAPAVERACEÆ.—*Anodyne.*
Papaver somniferum, L. E. D.—*W.* 185, *R.* 136, *H.* vi. 40.
——— Rhæas, L. E. D.—*W.* 186, *H.* vi. 38.
FRANGULACEÆ.—*Demulcent, purgative.*
Rhamnus catharticus, L. E. D.—*W.* 114, *R.* 159, *H.* v. 43.
TEREBINTHACEÆ.—*Resinous, stimulant.*
Amyris elimifera, L. D.

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[*] Travels in the Interior of Southern Africa; by William J. Burchell, Esq. 2 vols 4to. London, 1822. See vol. i. p. 476.

[†] Comment. Gotting. vol. ix. p. 194. Gott. 1789.

[‡] H. T. Colebrooke, Esq. Asiatic Transactions, vol xii p. 537.

Amyris Gileadensis, E.—*W.* 192.
Boswellia serrata, D.—*H.* x. 46.
Pistacia Terebinthus, L. D.—*W.* 153.
——— Lentiscus, L. E. D.—*W.* 152.
Rhus Toxicodendron, L. E. D.—*R.* 156, *H.* ix. 1.
Toluifera Balsamum, L. E. D.—*W.* 193.

POLYGALEÆ.—*Acrid, bitter, astringent.*
Polygala Senega, L. E. D.—*W.* 93, *B.* 30.
Krameria triandra, L. D.—*H.* viii. 14.

LEGUMINOSÆ.—*Gummy, amylaceous, saccharine, purgative, resinous, astringent.*
Acacia Arabica, E. D.—*W.* 67.—See *H.* x. 28—33.
——— vera, L. E. D.
——— Catechu, L. E. D.—*W.* 66, *H.* vii. 48.
Astragalus Tragacantha, E.—*W.* 98.—See *H.* x. 7.
——— verus, L.
——— Creticus, D.—See *H.* x. 8.
Cassia Senna, L. E. D.—*W.* 162, see *H.* ix. 41, 42, 43.
——— fistula, L. E. D.—*W.* 163, *H.* ix. 39.
Copaifera officinalis, L. E. D.—*W.* 137, *R.* 155, see *H.* x. 12—23.
Dolichos pruriens, L. E. D.—*W.* 172.
Geoffræa inermis, E. D.—*W.* 112, *R.* 154.
Glycyrrhiza glabra, L. E. D.—*W.* 167, *H.* v. 42.
Hæmatoxylon Campechianum, L. E. D.—*W.* 17, *H.* x. 44.
Myroxylon Peruiferum, L. E. D.
Pterocarpus Santalinus, L. E. D.—*W.* 154.
Pterocarpus Draco, E.—*H.* ix. 9.
——— erinacea, L.—Pterocarpus Africanus, Hooker *.
Spartium Scoparium, L. E. D.—*W.* 89, *R.* 152, *H.* ix. 10.
Tamarindus Indica, L. E. D.—*W.* 166, *H.* x. 41.

ROSACEÆ.—*Saccharine, emulsive, astringent, narcotic.*
Amygdalus communis, L. E. D.—*W.* 83, *H.* iv. 39.
——— *var.* amara, L. D.—*H.* iv. 39.
——— Persica, D.—*H.* iv. 38.
Geum urbanum, D.—*W.* 259, *H.* iv. 33.
Prunus domestica, L. E. D.—*W.* 85.
——— Laurocerasus, D.—*W.* 240.
Pyrus Cydonia, L.—*W.* 79, *H.* iv. 47.
Rosa canina, L. E. D.—*W.* 139.
——— centifolia, L. E. D.—*W.* 140.
——— Gallica, L. E. D.—*W.* 141.
Tormentilla erecta, L. E. D.—*H.* ii. 48.

SALICARIÆ.—*Astringent.*
Lythrum Salicaria, D.—*H.* iii. 29.

MYRTI.—*Aromatic; astringent.*
Melaleuca Leucadendron, E. D.—*W.* 229, *H.* x. 9.
——— Cajuputi, L.—*M. B.* 84.

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* Travels in Western Africa; by Major William Gray, and the late Staff-Surgeon Dochard. 8vo. London, 1825. See p. 395.

MYRTI.
Myrtus Pimenta, L. E. D.—*W*. 26, *H*. x. 37.
Punica Granatum, L. E. D.—*W*. 58, *H*. x. 35.
Eucalyptus resinifera, E.—*H*. x. 5.
Eugenia caryophyllata, L. E. D.—*W*. 135, *H*. x. 38.
UMBELLIFERÆ.—*Aromatic, fœtid stimuli.*
Anethum Fœniculum, L. E. D.—*W*. 160, *H*. vii. 18.
———— graveolens, L.—*W*. 159, *H*. vii. 17.
Angelica Archangelica, E. D.—*W*. 50, *R*. 108, *H*. vii. 8.
Bubon Galbanum, L. E. D.—*W*. 12.
Carum Carui, L. E. D.—*W*. 45, *H*. vii. 19.
Conium maculatum, L. E. D.—*W*. 22, *R*. 107, *B*. 11, *H*. i. 31.
Coriandrum sativum, L. E. D.—*W*. 181, *H*. vii. 13.
Cuminum Cyminum, L.—*W*. 191, *H*. vii. 11.
Daucus Carota, L. E. D.—*W*. 161, *H*. vii. 2.
Ferula Assafœtida, L. E. D.—*W*. 8, *R*. 109.
* Heracleum gummiferum, L. E. D.
Pastinaca Opoponax, L. D.—*W*. 113.
Pimpinella Anisum, L. E. D.—*W*. 180, *H*. vii. 22.
CAPRIFOLIÆ.—*Laxative.*
Sambucus nigra, L. E. D.—*W*. 76, *H*. iv. 16.
RUBIACEÆ.—*Tonic, emetic.*
Cinchona cordifolia, L. E. D.—*R*. 94, *H*. vii. 40.
———— lancifolia, L. E. D.—*R*. 93, *H*. vii. 48.
———— oblongifolia, L. E. D.—*W*. 201, *R*. 95, *H*. vii. 41.
Cephaëlis Ipecacuanha, L. D.—*R*. 97, *St H*. vi. *H*. viii. 20.
Rubia tinctorum, L. E. D.—*W*. 68.
VALERIANEÆ.—*Fœtid stimulant.*
Valeriana officinalis, L. E. D.—*W*. 96, *R*. 91, *H*. iii. 32.
COMPOSITÆ.—*Bitter stimulant, narcotic.*
a. *Corymbiferæ.*
Anthemis nobilis, L. E. D.—*W*. 103, *H*. x. 47.
———— Pyrethrum, L. E. D.—*W*. 104.
Arnica montana, E. D.—*W*. 4, *R*. 90, *H*. vi. 47.
Artemisia Absinthium, L. E. D.—*W*. 120, *R*. 89, *H*. ii. 11.
———— Chinensis, D.
———— Indica, D.
———— Santonica, E. D.—*W*. 123.
Inula Helenium, L. D.—*W*. 129, *H*. vi. 45.
Tanacetum vulgare, D.—*W*. 115, *H*. ii. 6.
Tussilago Farfara L. E. D.—*W*. 13. *H*. ii. 16.
b. *Cynarocephalæ.*
Arctium Lappa, E. D.—*W*. 15, *H*. ii. 35.
Cnicus (Centaurea) benedictus, L. E. D.—*W*. 42.
c. *Cichoraceæ.*
Lactuca virosa, E. D.—*W*. 250, *R*. 88, *H*. i. 47.
——— sativa, L. E. D.—*H*. vii. 30.

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* D. C. L. Willdenow, Hortus Berolinensis, folio. Berolini, 1816. See Tab. 53, 54.

COMPOSITÆ.
Leontodon Taraxacum, L. E. D.—*W.* 3, *H.* ii. 4.
CUCURBITACEÆ.—*Bitter, purgative.*
Cucumis Colocynthis, L. E. D.—*W.* 175, *R.* 174.
Momordica Elaterium, L. E. D.—*W.* 43. *R.* 173, *H.* viii. 45.
ERICINEÆ.—*Astringent, narcotic.*
Arbutus Uva-ursi, L. E. D.—*W.* 70, *B.* 6. *H.* iv. 20.
Rhododendrum Chrysanthum, E.—*W.* 149, *R.* 84, *H.* x. 27.
Pyrola Umbellata, D.—*M. B.* 93.
EBENACEÆ.—*Resinous, balsamic.*
Styrax officinale, L. E. D.—*W.* 71, *H.* xi. 23.
——— Benzoin, L. E. D.—*W.* 72, *H.* xi. 24.
OLEINEÆ.—*Oleaginous, demulcent.*
Olea Europæa, L. E. D.—*W.* 136, *H.* x. 10.
Fraxinus Ornus (Manna), L. E. D.—*W.* 36, *M. B.* 53.
STRYCHNEÆ.—*Bitter, narcotic.*
Strychnos Nux-vomica, D.—*W.* 223, *R.* 81, *H.* i. 17.
GENTIANEÆ.—*Bitter, tonic.*
Chironia (Erythræa) Centaureum, L. E. D.—*W.* 157.
Gentiana lutea, L. E. D.—*W.* 156, *R.* 72.
Menyanthes trifoliata, L. E. D.—*W.* 2, R. 73, *B.* 46, *H.* iii. 14.
Spigelia Marilandica, L. E. D.—*W.* 105, *R.* 76, *B.* 14.
CONVOLVULACEÆ.—*Resinous purgative.*
Convolvulus Scammonia, L. E. D.—*W.* 5, *R.* 71.
———— Jalapa, L. E. D.—*W.* 21, *R.* 70.
BORAGINEÆ.—*Mucilaginous, colouring.*
Anchusa tinctoria, E.—*W.* 92, *H.* x. 11.
SOLANEÆ.—*Narcotic, acrid.*
Atropa Belladonna, L. E. D.—*W.* 1, *R.* 63, *H.* i. 43.
Capsicum annuum, L. E. D.—*W.* 144, *H.* x. 24.
Datura Stramonium, L. E. D.—*W.* 124, *R.* 62, *B.* 1, *H.* iv. 7.
Hyoscyamus niger, L. E. D.—*W.* 52, *R.* 57, *B.* 17.
Nicotiana Tabacum, L. E. D.—*W.* 60, *R.* 60, *B.* 40.
Solanum Dulcamara, L. E. D.—*W.* 33, *R.* 68, *B.* 18, *H.* ii. 39.
Verbascum Thapsus, D.—*W.* 125.
PERSONATÆ.—*Narcotic, diuretic.*
Digitalis purpurea, L. E. D.—*W.* 24, *R.* 53, *H.* i. 45.
Gratiola officinalis, E.—*W.* 47, *R.* 56, *H.* iii. 13.
Scrophularia nodosa, D.—*R.* 51, *H.* v. 35.
LABIATÆ.—*Fragrant.*
Hyssopus officinalis, E.—*W.* 65, *H.* vi. 18.
Lavandula spica, L. E. D.—*W.* 55, *H.* viii. 37, 38.
Marrubium vulgare, L. E. D.—*W.* 97.
Melissa officinalis, E. D.—*W.* 147, *H.* vi. 32.
Mentha Piperita, L. E. D.—*W.* 169, *R.* 50.
——— Pulegium, E.—*W.* 171.
——— viridis, L. D.—*W.* 176.
Origanum Majorana, E. D.—*W.* 165, *H.* viii. 9.
———— vulgare, L. D.—*W.* 164, *H.* viii. 8.
Rosmarinus officinalis, L. E. D.—*W.* 87, *H.* vii. 25.
Salvia officinalis, E.—*W.* 38, *H.* vi. 1.

POLYGONEÆ.—*Astringent, acid, purgative.*
  Polygonum Bistorta, L. E. D.—*W.* 34, *H.* v. 19.
  Rheum palmatum, L. E. D.—*W.* 46.
  ——— undulatum, D.
  Rumex aquaticus, D.—*W.* 178.
  ——— Acetosa, L. E. D.—*W.* 69.

LAURINEÆ.—*Aromatic, narcotic.*
  Laurus Cinnamomum, L. E. D.—*W.* 27.
  ——— Cassia, L. E. D.
  ——— nobilis, L. E. D.—*W.* 32.
  ——— Sassafras, L. E. D.—*W.* 31, *B.* 35.
  ——— Camphora, L. E. D.—*W.* 155, *R.* 44.

MYRISTICEÆ.—*Aromatic.*
  Myristica moschata, L. E. D.—*W.* 134, *H.* ix. 12.

THYMALEÆ.—*Acrid.*
  Daphne Mezereum, L. E. D.—*W.* 23, *R.* 41, *H.* iii. 43.

ARISTOLOCHIÆ.—*Acrid.*
  Aristolochia Serpentaria, L. E. D.—*W.* 106, *R.* 40, *B.* 49, *H.* ix. 21.
  Asarum Europæum, L. E. D.—*W.* 86, *R.* 38, *H.* i. 44.

EUPHORBIACEÆ.—*Stimulant, purgative, resinous, oily.*
  Croton (Eleutheria) Cascarilla, L. E. D.—*W.* 41.
  ——— Tiglium, L. D.—*M. B.* 4.
  Euphorbia officinarum, L.
  ——— Canariensis, D.
  Ricinus communis, L. E. D.—*W.* 61, *R.* 168, *H.* x. 48.

MONIMIEÆ.—*Stimulant.*
  Dorstenia Contrajerva, L. E.—*W.* 51.

URTICEÆ.—*Acrid, bitter, demulcent.*
  Ficus Carica, L. E. D.—*W.* 130, *H.* ix. 13.
  Humulus Lupulus, L. D.—*B.* 60, *H.* viii. 36.
  Morus nigra, L. D.—*W.* 129.
  Piper nigrum, L. E. D.—*W.* 187, *R.* 176.
  ——— longum, L. E. D.—*W.* 188.
  ——— Cubeba, D.

AMENTACEÆ.—*Astringent, mucilaginous.*
  Quercus Robur, E. D.—*W.* 126, *H.* vi. 35.
  ——— infectoria, D.
  ——— pedunculata, L.—*H.* vi. 36.
  Salix fragilis, D.—*W.* 198.
  ——— alba, D.
  ——— Caprea, L. D.
  Ulmus campestris, L. E. D.—*W.* 197, *H.* iii. 15.

CONIFERÆ.—*Resinous.*
  Pinus Abies (Abies picea,) L. E. D.—*W.* 208, 209, *R.* 177.
  ——— sylvestris, L. E. D.—*W.* 207.
  ——— Larix (Larix Europæa,) E. D.—*W.* 210, *R.* 178.
  ——— Balsamea (Abies balsamea,) L. E. D.—*M. B.* 74.
  Juniperus communis, L. E. D.—*W.* 95, *B.* 44.
  ——— Sabina, L. E. D.—*W.* 94, *R.* 179.
  ——— Lycia, L. E.—*W.* 206.

MONOCOTYLEDONES.

DRYMYRRHIZÆ.—*Aromatic, amylaceous.*
Amomum Zingiber (Z. officinale) L. E. D.—*W.* 11.
——— Cardamomum, D.—*W.* 131.
——— repens, E.—Matonia Cardamomum, L.
Curcuma longa, E.—*W.* 132.
IRIDEÆ.—*Fragrant.*
Crocus sativus, L. E. D.—*W.* 176, *R.* 37, *H.* vi. 25.
Iris Florentina, E.—*W.* 39.
SMILACEÆ.—*Mucilaginous.*
Smilax Sarsaparilla, L. E. D.—*W.* 194.
LILIACEÆ.—*Pungent, bitter, purgative, emetic.*
Allium sativum, L. E. D.—*W.* 168, *R.* 30, *H.* vi. 6.
——— Cepa, D.
——— Porrum, L.
Aloe spicata, L. D.
——— vulgaris, D.—*R.* 27.
Scilla maritima, L. E. D.—*W.* 118, *R.* 29, *H.* xi. 21.
COLCHICACEÆ.—*Narcotic.*
Colchicum autumnale, L. E. D.—*W.* 177, *R.* 23, *H.* v. 45.
Veratrum album, L. E. D.—*W.* 100, *R.* 21.
PALMÆ.—*Oily, amylaceous.*
Cocos butyracea, E.
JUNCEÆ.—*Fragrant.*
Acorus Calamus, L. E.—*W.* 175, *H.* vi. 31.
GRAMINEÆ.—*Amylaceous, saccharine.*
Avena sativa, L. E. D.
Hordeum distichon, L. E. D.
Saccharum officinarum, L. E. D.—*W.* 196, *H.* ix. 30, 31.
Triticum hybernum, L. E. D.
FILICES.
Aspidium (Polypodium) Filix mas, L. E. D.—*W.* 49.

ACOTYLEDONES.

LICHENES.—*Amylaceous colouring.*
Lichen Islandicus, L. E.—Cetraria Islandica, D.—*W.* 205.
Rocella tinctoria, D.—*M. B.* 69.
FUNGI.
Boletus igniarius, E.
ALGÆ.
Fucus vesiculosus, L. D.

Classification of the Materia Medica as objects of Natural History in its early state.

THE great number of articles employed in medicine, has rendered necessary their classification upon various principles, according to the state of the science at the time.

One of the earliest was to classify them according to the kingdom of nature to which the substances belonged, with subdivisions derived from some obvious circumstance. In regard to the vegetable kingdom, the numerous articles furnished by it were divided according to the part or organ which was used in medicine. This arrangement was long followed in all the public Pharmacopœias, and is still followed by Guibourt in his recent valuable work on Pharmacology *. As such an arrangement is instructive and useful to the practical apothecary, I have classified in this way the simples belonging to the Materia Medica of the British Colleges.

I. ORGANIC SUBSTANCES.

1. VEGETABLE SUBSTANCES.

a. *Entire vegetables : Cryptogamic.*
Boletus igniarius, E.
Lichen Islandicus, L. E.—Cetraria Isl. D.
Rocella tinctoria, D.
Fucus vesiculosus, L. D.

b. *Bulbs.*
Allium sativum, L. E. D.
——— Cepa, D.
——— Porrum, L.
Colchicum autumnale, L. E. D.
Scilla maritima, L. E. D.

c. *Roots.*
Acorus Calamus, L. E.
Althæa officinalis, L. E. D.
Amomum Zingiber, E. D.—Zingiber officinale, D.
Anchusa tinctoria, E.
Angelica Archangelica, E.
Anthemis Pyrethrum, L. E. D.
Arctium Lappa, E. D.
Aristolochia Serpentaria, L. E. D.
Arnica montana, E. D.
Aspidium Filixmas, L. E. D.
Atropa Belladona, D.
Cochlearia Armoracia, L. E. D.
Colomba, E. D.—Cocculus palmatus, L.
Convolvulus Jalapa, L. E. D.
Curcuma longa, D.
Daucus Carota, L. E. D.
Dorstenia Contrajerva, L. E.
Gentiana lutea, L. E. D.
Geum urbanum, D.
Glycyrrhiza glabra, L. E. D.
Helleborus niger, L. E. D.
Inula Helenium, L. D.
Ipecacuanha, L. E. D.—Callicocca Ip. L.—Cephaëlis Ip. D.
Iris Florentina, E.
Krameria triandra, L. D.
Laurus Sassafras, L. E.
Leontodon Taraxacum, L. E. D.
Polygala Senega, L. E. D.
Polygonum Bistorta, L. E. D.
Rheum palmatum, L. D.
——— undulatum, D.
——— Russicum vel Turcicum, E.
——— Sinense vel Indicum, E.
——— Britannicum, E.
Smilax Sarsaparilla, L. E. D.
Spigelia Marilandica, L. E. D.

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* Histoire abregée des Drogues simples, par N. J. B. G. Guibourt, Pharmacien, Membre adjoint de l'Academie Royal de Médécine. 2de edition, corrigée et augmentée. 8vo. Paris, 1826. Pp. xvi. 471, and 528.

Tormentilla officinalis, L. D.—T. erecta, E.
Valeriana officinalis, L. E. D.
Veratrum album, L. E. D.

d. *Herbs.*

Centaurea benedicta, E.—Cnicus benedictus, D.
Cochlearia officinalis, D.
Datura Stramonium, L. E. D.
Gratiola officinalis, E.
Hyoscyamus niger, L. E. D.
Hyssopus officinalis, E.
Lactuca sativa, L. E. D.
——— virosa, E. D.
Linum catharticum, L.
Lythrum Salicaria, D.
Malva Sylvestris, L. E.
Marrubium vulgare, L. E. D.
Melissa officinalis, E. D.
Mentha Piperita, L. E. D.
——— Pulegium, L. E. D.
——— viridis, L. E. D.
Origanum Majorana, E. D.
———— vulgare, L. D.
Oxalis Acetosella, L.
Pyrola umbellata, D.
Ranunculus Flammula, D.
Sisymbrium Nasturtium, E.

Leaves.

Aconitum Napellus, L. E. Aconitum paniculatum, D.
Althæa officinalis, L. E. D.
Amygdalus Persica, D.
Arbutus Uva ursi, L. E. D.
Arnica montana, D.
Artemisia Absinthium, L. E. D.
Asarum Europæum, L. E. D.
Atropa Belladona, L. E. D.
Cassia Senna, L. E. D.
Citrus Aurantium, D.
Conium maculatum, L. E. D.
Digitalis purpurea, L. E. D.
Diosma crenata, D.
Helleborus fœtidus, L.
Juniperus Sabina, L. E. D.
Laurus nobilis, L. E. D.
Menyanthes trifoliata, L. E. D.
Momordica Elaterium, D.
Nicotiana Tabacum, L. E. D.
Ranunculus acris, D.
Rhododendron Chrysanthum, E.
Rhus Toxicodendron, L. E. D.
Ruta graveolens, L. E. D.
Salvia officinalis, E. D.
Scrophularia nodosa, D.
Tanacetum vulgare, D.
Tussilago Farfara, L. E. D.
Verbascum Thapsus, D.

Summits.

Juniperus communis, L. D.
Rosmarinus officinalis, L. E. D.
Spartium Scoparium, L. E. D.

Twigs.

Solanum Dulcamara, L. E. D.

Flowers, and Flowering Tops.

Anthemis nobilis, L. E. D.
Arnica montana, E. D.
Artemisia vulgaris, D. E.
Cardamine pratensis, L. E. D.
Chironia Centaureum, L. E. Erythræa Centaureum, D.
Citrus Aurantium, D.
Crocus sativus, L. E. D.
Dianthus Caryophyllus, E. D.
Eugenia caryophyllata, L. E. D.
Lavandula spica, L. E. D.
Laurus Cassia, E.
Malva sylvestris, E.
Papaver Rhæas, L. D.
Punica Granatum, D.
Rosa centifolia, L. E. D.
—— Gallica, L. E. D.
Sambucus nigra, L. E. D.
Viola odorata, E. D.

Fruits ; Capsules.

Capsicum annuum, L. E. D.
Cassia fistula, L. E. D.
Citrus Aurantium ; Succus, L. E. D.
——————— Cortex, L. E. D.
—— medica ; Succus, L. E. D.
———— Cortex, L. E. D.
Cucumis Colocynthis, L. E. D.
Dolichos pruriens, L. E. D.
Ficus Carica, L. E. D.
Humulus Lupulus, L. D.
Juniperus communis, L. E. D.
Laurus nobilis, L. E. D.
Menispermum Cocculus, E.—Cocculus suberosus, D.
Momordica Elaterium, L. D.

Morus nigra, L. D.
Myrtus Pimento, L. E. D.
Papaver somniferum, L. E. D.
Piper longum, L. E. D.
—— nigrum, L. E. D.
—— Cubeba, D.
Prunus domestica, L. E. D.
Punica Granatum, L. E. D.
Rhamnus catharticus, L. E. D.
Rosa canina, L. E. D.
Sambucus nigra, E. D.
Tamarindus Indica, L. E. D.
Vitis vinifera, L. E. D.

Seeds.

Amomum repens, E.—Amomum cardamomum, D. — Matonia cardamomum, L.
Amygdalus communis, *var.* dulcis, L. E. D.
Amygdalus communis, *var.* amarus, L. D.
Anethum fœniculum, L. E. D.
——— graveolens, L.
Angelica Archangelica, D.
Arctium Lappa, D.
Artemisia Santonica, E. D.
Avena sativa, L. E. D.
Carum Carui, L. E. D.
Colchicum autumnale, L. D
Coriandrum sativum, L. E. D.
Conium maculatum, L.
Cuminum Cyminum, L.
Datura Stramonium, L. D.
Daucus Carota, L. D.
Delphinium Staphisagria, L. E. D.
Digitalis purpurea, L.
Hordeum distichon, L. E. D.
Hyoscyamus niger, L. E.
Linum usitatissimum, L. E. D.
Myristica moschata; Macis, E.D.
———— Nux, L. E. D.
Pimpinella Anisum, L. E. D.
Pyrus Cydonia, L.
Ricinus communis, L. E.
Sinapis alba, E. D.
——— nigra, L. D.
Strychnos Nux vomica, D.

Barks.

Angustura; Bonplandia trifoliata, E. D.—Cusparia febrifuga, L.
Canella alba, L. E. D.
Cinchona cordifolia,
——— lancifolia, } L.E.D.
——— oblongifolia,
Croton Eleutheria, E.—Croton Cascarilla, L. D.
Daphne Mezereon, L. E. D.
Geoffroya inermis, E. D.
Laurus Cassia, E. D.
——— Cinnamomum, L. E. D.
——— Sassafras, D.
Punica Granatum; radicis cortex, D.
Quassia Simaruba, L. E. D.
Salix Capræa, L. D.
—— fragilis, D.
—— alba, D.
Sambucus nigra, E. D.
Swietenia Mahagoni, E.
Ulmus campestris, L. E. D.
Wintera aromatica, E.—Drymis aromatica, D.

Woods.

Guaiacum officinale, L. E. D.
Hæmatoxylum Campechianum, L. E. D.
Laurus Sassafras, L. E. D.
Pterocarpus Santalinus, L. E. D.
Quassia excelsa, L. E. D.

Concrete Juices, gummy and extractive.

Gummi Arabicum; Acacia Arabica, E. D.—Acacia vera, L. E. D.
Gummi Tragacantha; Astragalus Tragacantha, E. — Ast. Creticus, D.—Ast. verus, L.
Kino, D.—Eucalyptus resinifera, E.—Pterocarpus erinacea, L.
Lactucarium, Lactuca sativa, E.
Manna; Fraxinus Ornus, L.E.D.
Opium; Papaver somniferum, L. E. D.

Resins and Gum Resins.

Ammoniacum; Heracleum gummiferum, L. E. D.
Assafœtida—Ferula Assafœtida, L. E. D.

Balsamum Gileadense; Amyris Gileadensis, E.
——— Peruvianum. Myroxylon Peruiferum, L. E. D.
——— Tolutanum—Toluifera balsamum, L. E. D.
Benzoinum — Styrax Benzoin, L. E. D.
Camphora—Laurus Camphora, L.E.D.—Dryabalanops Camphora, D.
Copaiba; Copaifera officinalis, L. E. D.
Elemi; Amyris elemifera, L. D.
Euphorbium; Euphorbia officinarum, L. E.—Euphorbia Canariensis, D.
Galbanum; Bubon Galbanum, L. E. D.
Gambogia, Stalagmitis Cambogioides, L. E. D.
Guaiacum; Guaiacum officinale, L. E. D.
Myrrha, L. E. D.
Olibanum, Juniperus Lycia, L.E. —Boswellia serrata, D.
Opoponax—Pastinaca Opoponax, L. D.
Pix Burgundica, E. D.—Pix Abietina, L.—Pinus Abies, L. D.—Pini varii, E.
Pix liquida, L. D.—Resina empyreumatica, E.—Pinus sylvestris, L. D.—Varii Pini, E.
Pix nigra, L. E.—Pinus sylvestris, L.—Pini varii, E.
Resina, D.—Resina alba, E.—Resina flava, L.—Pinus sylvestris, L. D.—Pini varii, E.
Sagapenum, L. E. D.
Scammoneum; Convolvulus Scammonia, L. E. D.
Storax—Styrax officinale, L. E. D.
Terebinthina Canadensis; Pinus balsamea, L. E. D.
——— Chia; Pistachia Terebinthus, L.
——— Veneta; Pinus Larix, E. D.
Terebinthina vulgaris; Pinus sylvestris, L. E. D.
Thus, D.—Abietes resina, L.—Pinus Abies, L. D.

Extracts.

Aloe hepatica, E. D.—Aloe vulgaris, D.
——— Socotorina, L.E.D.—Aloe spicata, L. E. D.
Catechu — Acacia Catechu, L. E. D.
Glycyrrhiza glabra, L. E. D.
Saccharum purificatum, et non purificatum.—Saccharum officinarum, L. E. D.
Syrupus empyreumaticus, E. D.

Oils, volatile and distilled.

Citrus medica, L. E. D.
Eugenia caryophyllata, L. E. D.
Laurus Cinnamomum, L. D.
——— Sassafras, D.
Melaleuca Cajuputi, L. — M. Leucadendron, E. D.
Myristica Moschata, D.
Origanum vulgare, D.
Oleum Terebinthinæ. — Pinus sylvestris, L. D.—Pini variæ species, E.

Oils, fixed and expressed.

Cocos butyracea, E.
Croton Tiglium, L. D.
Laurus nobilis, E.
Myristica moschata, L. D.
Olea Europæa, L. E. D.

Vegetable products and miscellaneous substances.

Amylum.—Triticum hybernum, L. E. D.
Elaterium; Momordica Elaterium, L. E. D.
Farina tritici, L. D.
Farina avenæ, E.
Gallæ, L. E. D.—Quercus infectoria, D.
Vinum album Hispanum, E. D.
Cerevisiæ fermentum, L. E.
Alcohol fortius, L. E. D.
——— dilutius, L. E. D.
Carbo ligni, L. E. D.
Bitumen petroleum, L. E. D.
Succinum, L. E. D.

2. ANIMALS AND ANIMAL SUBSTANCES.

Cantharides, L. E. D.—Cantharis vesicatoria, D.—Lytta vesicatoria, L.—Meloe vesicatorius, E.
Castoreum; Castor Fiber, L.E.D.
Cera flava, L. E. D.
—— alba, L. E. D.
Cetaceum, L.D.–Spermaceti, E.
Coccinella; Coccus cacti, L.E.D.
Cornua, L. E.
Hirudo medicinalis, D.
Mel, L. E. D.
Moschus; Moschus moschiferus, L. E. D.
Ossa, E. D.
Ovum.—Phasianus Gallus, L.
Spongia officinalis, L. E. D.

II. INORGANIC.

a. *Simples and Inflammables.*
Carbo ligni, L. E. D.
Bitumen Petroleum, L. E. D.
Iodinium, D.
Succinum, L. E. D.
Sulphur, L. E. D.

Acids.
Acetum, L. E. D.
Acidum nitricum, L. E. D.
——— sulphuricum, L. E. D.

Alkalis, Earths, and Salts.
Alumen, L. E. D.
Ammoniæ murias, L. E. D.
Barytæ carbonas, E.
——— sulphas, E. D.
Calx, E. D.
Calcis carbonas, L. E. D.
Magnesiæ subcarbonas, L.
———— sulphas, L. E. D.
Potassæ subcarbonas, L. E. D.
——— supertartras impurus, L. D.
——— ———— purus, L. E. D.
——— nitras, L. E. D.
——— sulphas, L.
Sodæ subcarbonas, L. E. D.
—— subboras, L. E. D.
Sodæ murias, L. E. D.

Metals, and Metallic compounds.
Antimonii sulphuretum, L.E.D.
———— vitrum, L.
Argentum, L. E. D.
Arsenici oxydum, L. E. D.
Bismuthum, L. D.
Cupri subacetas, L. E. D.
——— sulphas, L. E. D.
Ferri fila, L. E. D.
—— limatura, L. E. D.
—— sulphas, L. E. D.
—— oxydum nigrum, E. D.
Hydrargyrum, L. E. D.
Hydrargyri sulphuretum rubrum, L. E. D.
Manganesium, D.
Plumbum, E.
Plumbi oxidum rubrum, E.
————— semivitreum, L. E. D.
——— carbonas, L. E. D.
Stanni limatura, L. E. D.
—— pulvis, E. D.
Zincum, L. E. D.
Zinci oxidum impurum, E.
—— carbonas impurus, L.E.D.

Physiological Classification of the Materia Medica, by Dr Duncan.

By the expression *Physiological Classification* is here meant an arrangement of substances according to the effects which they produce upon the body in a state of health, in contra-

distinction to their *therapeutical* effects, which depend on the presence of certain diseases. The physiological effect is constant both in health and disease; but the therapeutical effects are various according to the nature of the disease present. Thus, Cinchona is febrifuge if it stop an ague—antiseptic if it check gangrene—antispasmodic if it cure hysteria—anthelmintic if it expel worms. To a physiological classification of the Materia Medica authors have been gradually approaching; but a few therapeutical orders are still generally retained, as antispasmodics, lithontriptics, anthelmintics, antiseptics, &c.; while some systematic writers have admitted too much of hypothesis into their principle of classification. I have attempted to avoid therapeutical distinctions entirely, and to derive the characters of the orders from the obvious and recognised effects of medicinal agents.

External Agents act,
- I. By nourishing the Body, ... ALIMENTA,
  - *a.* Drink......Potus.
    - When they act medicinally, ... Diluentia.
  - *b.* Food......Cibi.
    - When they act medicinally, ... Demulcentia.
- II. By Evacuation, ... EVACUANTIA,
  - *a.* By the skin insensibly, ... Diaphoretica.
    - ———— sensibly, ... Sudorifica.
  - *b.* By the mucous membrane,
    - of the Nostrils, ... Errhina.
    - of the Lungs, ... Expectorantia.
    - of the Stomach, ... Emetica.
    - of the Intestines, ... Cathartica.
    - of the Uterus, ... Emmenagoga.
  - *c.* By Glandular Secretion,
    - The Kidneys, ... Diuretica.
    - The Salivary Glands, ... Sialogoga.
- III. By exciting the vital powers,...STIMULANTIA.
  - *a.* Chiefly of the parts to which they are applied, } TOPICA.
    - Applied externally,
      - Causing redness, ... Rubefacientia.
      - ——— serous secretion, ... Vesicantia.
      - ——— purulent secretion, ... Suppurantia.
    - Administered internally,
      - Condimenta when alimentary.
        - When acting medicinally, ... Carminativa.
  - *b.* Of the system generally, GENERALIA.
    - *a.* Obscurely, but more durably, ... } PERMANENTIA.

Producing no immediate obvious effect, ... } TONICA.
Constricting fibres and coagulating fluids, ... } ASTRINGENTIA.

b. More evidently but less durably, ... } TRANSITORIA.
Acting on the organic functions, CALEFACIENTIA.
Acting on the mental functions, INEBRIANTIA.

IV. By depressing the vital powers, DEPRIMENTIA.
Acting on the organic functions, ... REFRIGERANTIA.
Acting on the mental functions, ... NARCOTICA.

V. By chemical influence on the fluids, ... } CHEMICA.
Acidifying, ... ACIDA.
Alkalizing, ... ALKALINA.

OFFICINAL EMOLLIENTS AND DEMULCENTS *.

VEGETABLE.

1. *Amylaceous, Mucilaginous or Saccharine* †.

MALVACEÆ.
- Malva sylvestris—*Herba.*
- Althæa officinalis—*Radix—Folia.*

LINEÆ.
- Linum usitatissimum—*Semina.*

PAPAVERACEÆ.
- Papaver somniferum—*Capsulæ.*

LEGUMINOSÆ.
- Acacia vera—*Gummi Arabicum.*
- Astragalus Tragacantha—*Gummi Tragacantha.*
- Glycyrrhiza glabra—*Radix—extractum.*

ROSACEÆ.
- Pyrus Cydonia—*Semina.*
- Prunus domestica—*Fructus.*

UMBELLIFERÆ.
- Daucus Carota—*Radix.*

COMPOSITÆ.
- Anthemis nobilis—*Flores.*
- Inula Helenium—*Radix.*
- Tussilago Farfara—*Folia.*
- Lactuca sativa—*Folia.*

BORAGINEÆ.
- Anchusa tinctoria—*Radix.*

SOLANEÆ.
- Solanum Dulcamara—*Stipites.*

LABIATÆ.
- Marrubium vulgare—*Herba.*

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[*] That these lists may not extend to too great a length, I have thought it expedient to limit them to the articles which are officinal in some of the British Pharmacopœias, subjoining occasionally a short notice of some other substances.

[†] The substances in this order agree in being digested and assimilated when taken into the stomach. In their general effect on the system they are alimentary, and not medicinal. The action for which they are used in medicine is purely local. As fluids, they soften the tissues to which they are applied, and from their viscidity they protect it from irritants. In their nature they are either oily, or saccharine, or glutinous. The last section includes all such substances as gum, starch, albumen, and gelatine, and is the most bland of the whole; while the saccharine substances are not devoid of stimulus.

- Urticeæ.
  - Ficus Carica—*Fructus*.
- Smilaceæ.
  - Smilax Sarsaparilla—*Radix*.
- Gramineæ.
  - Avena sativa—*Semina*.
- Gramineæ.
  - Hordeum distichum—*Semina*.
  - Triticum hybernum—*Semina*.
  - Saccharum officinarum—*Saccharum*.
- Lichenes.
  - Lichen Islandicus.

II. *Oleaginous.*

- Lineæ.
  - Linum usitatissimum—*Oleum*.
- Oleineæ.
  - Olea Europæa—*Oleum*.
- Rosaceæ.
  - Amygdalus communis—*Semina*—*Oleum*.
- Palmæ.
  - Cocos butyracea—*Oleum palmæ*.

ANIMAL.

- Mucous.
  - Ichthyacolla.
  - Cornu cervi—*Gelatina*.
  - Mel.
- Oleaginous.
  - Adeps suillus.
  - —— ovillus.
  - Cetaceum.
  - Cera.

OFFICINAL DIAPHORETICS AND SUDORIFICS.

VEGETABLE[*].

- Rutaceæ.
  - Guaiacum officinale—*Cortex*—*Lignum*—*Resina*.
  - Ruta graveolens—*Herba*.
- Cruciferæ.
  - Sinapis nigra—*Semina*.
- Papaveraceæ.
  - Opium.
- Polygaleæ.
  - Polygala Senega—*Radix*.
- Leguminosæ.
  - Copaifera officinalis—*Resina*.
- Caprifoliæ.
  - Sambucus nigra—*Flores*.
- Rubiaceæ.
  - Cephaëlis Ipecacuanha—*Radix*.
- Valerianeæ.
  - Valeriana sylvestris—*Radix*.
- Compositæ—Corymbiferæ.
  - Inula Helenium—*Radix*.
  - Arnica montana—*Radix*—*Herba*—*Flores*.
- CYNAROCEPHALEÆ.
  - Arctium Lappa—*Radix*.
- Ericineæ.
  - Rhododendron Chrysanthum—*Folia*.
- Solaneæ.
  - Capsicum annuum—*Fructus*.
  - Solanum Dulcamara—*Stipites*.
- Labiatæ.
  - Hyssopus officinalis—*Herba*.
  - Melissa officinalis—*Herba*.
  - Mentha pulegium—*Herba*.
  - Rosmarinus officinalis—*Herba*.
  - Salvia officinalis—*Herba*.
  - Laurus Sassafras—*Cortex*.

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[*] Besides the vegetables here enumerated, many others act upon the skin, when their operation is directed to that organ by dilution conjoined with warmth. Of this nature are all vegetables which contain acrid resins, all spices, all fragrant herbs containing volatile oil, and all herbs possessed of a volatile pungent principle, as the cruciform plants and the onion tribe.

LAURINEÆ.
Laurus nobilis—*Folia.*
——— Camphora-*Camphora.*
THYMALEÆ.
Daphne Mezereon—*Cortex.*
ARISTOLOCHIÆ.
Aristolochia Serpentaria—*Radix.*
EUPHORBIACEÆ.
Croton cascarilla—*Cortex.*
MONIMIÆ.
Dorstenia Contrayerva-*Radix.*
SMILACEÆ.
Smilax Sarsaparilla—*Radix.*
JUNCEÆ.
Acorus Calamus—*Radix.*

ANIMAL.

Moschus.
Castoreum.

INORGANIC.

Alcohol.
Vinum.
Ætherea.
Olea volatilia.
Olea empyreumatica.
Ammoniæ sales.
Antimonialia.
Hydrargyrum [*].

IV. OFFICINAL ERRHINES [†].

VEGETABLE.

CUCURBITACEÆ.
Momordica Elaterium—*Succus spissatus.*
SOLANEÆ.
Nicotiana Tabacum—*Folia.*
LABIATÆ.
Hyssopus officinalis—*Herba.*
Lavandula vera—*Flores.*
Marrubium vulgare—*Herba.*
Melissa officinalis—*Herba.*
Mentha Pulegium--*Herba.*
——— viridis—*Herba.*
——— Piperita--*Herba.*
Origanum Majorana—*Herba.*
———— vulgare—*Herba.*
Rosmarinus officinalis—*Herba.*
LABIATÆ.
Salvia officinalis—*Herba.*
Teucrium Chamæpitys-*Herba.*
———— Marum--*Herba.*
ARISTOLOCHIÆ.
Asarum Europæum—*Herba.*
EUPHORBIACEÆ.
Euphorbia officinarum--*Resina.*
IRIDEÆ.
Iris Florentina--*Radix.*
COLCHICACEÆ.
Veratrum album—*Radix.*
GRAMINEÆ.
Saccharum officinarum—*Saccharum purificatum.*

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[*] The most powerful and certain sudorifics are heat, and exercise of all kinds and in all forms, especially when assisted by diluents.

[†] Every substance possessed of any degree of acrimony becomes an errhine when applied to the membrane lining the nostrils; and if it be snuffed up in the form of a fine powder it is apt to prove sternutatory.

INORGANIC.

Subsulphas hydrargyri.

V. OFFICINAL EXPECTORANTS.

A. Topical.

Applied in the form of liquid to the fauces.

Emollients and Demulcents in general.

Applied in the form of gas or vapour to the mucous membrane of the lungs.

Nicotiana Tabacum—*Folia.*
Datura Stramonium—*Herba.*
Myrrha.
Pix liquida.
Olea volatilia.
Aqua.

Alcohol.
Ætherea.
Acidum Benzoicum.
——— aceticum.
Ammonia.
Ammoniæ carbonas.

B. General.

Taken into the stomach, and acting through the circulation *.

VEGETABLE.

Terebinthaceæ.
  Amyris Gileadensis—*Terebinthina.*
  ——— Kataf ?—*Myrrha.*
  Toluifera Balsamum—*Balsamum.*
Polygaleæ.
  Polygala Senega—*Radix.*
Leguminosæ.
  Copaifera officinalis—*Terebinthina.*
  Myroxylon peruiferum—*Balsamum.*
Umbelliferæ.
  Bubon Galbanum—*Gummi-resina.*

Umbelliferæ.
  Ferula Assafœtida—*Gummi resina.*
  Ferula Ferulago ?—*Ammoniacum.*
  Ferula ? *Sagapenum.*
Rubiaceæ.
  Cephaëlis Ipecacuanha—*Radix.*
Ebenaceæ.
  Styrax officinale—*Balsamum.*
  ——— Benzoin—*Balsamum.*
Solanaceæ.
  Datura Stramonium—*Semina.*
Labiatæ.
  Hyssopus officinalis—*Herba.*
  Marrubium vulgare—*Herba.*

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* The existence of this order of expectorants can no longer be doubted, since the experiments of recent physiologists have proved that medicinal substances are absorbed into the circulating system, and that they stimulate the organ by which they are excreted. That the mucous membrane of the lungs is occasionally employed for this purpose, appears from the smell of the breath being tainted by these unassimilable substances.

- LABIATÆ.
  - Melissa officinalis—*Herba.*
  - Mentha Pulegium—*Herba.*
  - ——— sativa—*Herba.*
  - Salvia officinalis—*Herba.*
- ARISTOLOCHIÆ.
  - Asarum Európæum—*Folia.*
- LICHENES.
  - Lichen Islandicus.

INORGANIC.

Tartras antimonii.

VI. OFFICINAL EMETICS[*].

I. VEGETABLE.

- CRUCIFERÆ.
  - Sinapis nigra—*Seminum pulvis.*
- RUBIACEÆ.
  - Cephaëlis Ipecacuanha—*Radix.*
- COMPOSITÆ—CORYMBIFERÆ.
  - Anthemis nobilis—*Flores.*
- SOLANEÆ.
  - Nicotiana Tabacum—*Folia.*
- ARISTOLOCHIÆ.
  - Asarum Europæum—*Folia*
- LILIACEÆ.
  - Scilla maritima—*Bulbus.*

II. INORGANIC.

- Ammoniæ carbonas.
- Antimonium tartarizatum.
- Zinci sulphas.
- Cupri sulphas.

VII. OFFICINAL CATHARTICS.

I. VEGETABLE.

a. *Emollient, Mucilaginous, Saccharine.*

- VIOLACEÆ.
  - Viola odorata—*Flores.*
- SARMENTACEÆ.
  - Vitis vinifera—*Baccæ siccatæ.*
- CRUCIFERÆ.
  - Sinapis alba—*Semina integra.*
- LEGUMINOSÆ.
  - Cassia fistula—*Leguminis pulpa.*
  - Tamarindus Indica—*Legumen.*
- ROSACEÆ.
  - Prunus domestica.—*Fructus siccatus.*
  - Rosa canina—*Fructus.*
- CAPRIFOLIÆ.
  - Sambucus nigra—*Baccæ.*
- COMPOSITÆ—CICHORACEÆ.
  - Leontodon Taraxacum—*Radix.*
- OLEINEÆ.
  - Fraxinus ornus — *Succus concretus—Manna.*
- URTICEÆ.
  - Ficus carica—*Fructus siccatus.*
- GRAMINEÆ.
  - Hordeum distichon—*Semina.*
  - Saccharum officinarum — *Saccharum impurum.*

b. *Oily.*

- OLEINEÆ.
  - Olea Europæa—*Oleum.*
- EUPHORBIACEÆ.
  - Ricinus communis—*Oleum.*
  - Croton Tiglium—*Oleum.*
- CONIFERÆ.
  - Pinus sylvestris—*Oleum volatile.*

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[*] The number of substances capable of exciting vomiting is very great. The operation of all of them is assisted by repletion of the stomach; and where great torpor exists, titillation of the posterior fauces will sometimes provoke vomiting.

c. *Resinous.*

- GUTTIFERÆ.
  - Gambogia.
- TEREBINTHACEÆ.
  - Pistacia Terebinthus—*Terebinthina Chia.*
  - Amyris Gileadensis—*Terebinthina.*
- LEGUMINOSÆ.
  - Copaifera officinalis — *Terebinthina.*
- CONVOLVULACEÆ.
  - Convolvulvus Scammonia—*Resina.*
  - ———— Jalapa — *Radix —Resina.*
- EUPHORBIACEÆ.
  - Euphorbia officinarum—*Resina.*
- CONIFERÆ.
  - Pinus Larix—*Terebinthina.*
  - ——— Canadensis— *Terebinthina.*

d. *Extractive, nauseous, bitter, or acrid.*

- LINEÆ.
  - Linum catharticum—*Herba.*
- FRANGULACEÆ.
  - Rhamnus catharticus–*Baccæ.*
- LEGUMINOSÆ.
  - Cassia Senna—*Folia.*
  - Spartium Scoparium — *Summitates.*
  - Geoffroya inermis—*Cortex.*
- CAPRIFOLIÆ.
  - Sambucus nigra—*Cortex.*
- COMPOSITÆ—CINAROCEPHALÆ.
  - Arctium Lappa—*Radix.*
- CUCURBITACEÆ.
  - Cucumis colocynthis--*Pepones.*
  - Momordica Elaterium — *Succus concretus fructus.*
- GENTIANEÆ.
  - Menyanthes trifoliata—*Herba.*
  - Spigelia Marilandica—*Herba.*
- LABIATÆ.
  - Gratiola officinalis—*Herba.*
- IRIDEÆ.
  - Iris Florentina—*Radix.*
- FILICES.
  - Aspidium Filix-mas—*Radix.*

e. *Narcotic.*

- RANUNCULACEÆ.
  - Helleborus niger—*Radix.*
  - ———— fœtidus—*Radix.*
- SOLANACEÆ.
  - Nicotiana Tabacum—*Folia.*
- COLCHICACEÆ.
  - Colchicum autumnale—*Bulbus.*
  - Veratrum album—*Radix.*

f. *Astringent.*

- ROSACEÆ.
  - Rosa centifolia—*Petala.*
- POLYGONEÆ.
  - Rheum Turcicum—*Radix.*
  - Rumex aquaticus—*Radix.*

II. ANIMAL.

Emollient.

Honey.

III. INORGANIC.

a. *Saline.*

- Magnesia.
- Magnesiæ carbonas.
- ———— sulphas.
- Potassæ sulphas.
- ——— supersulphas.
- ——— tartras.

- Potassæ supertartras.
- ——— acetas.
- Sodæ murias.
- Sodæ phosphas.
- —— sulphas.
- —— et potassæ tartras.

b. *Metallic.*

- Calomelas.
- Pilulæ Hydrargyri.
- Pulvis Antimonialis.
- Tartras Antimonii.

c. *Inflammable.*

- Sulphur.

VIII. OFFICINAL EMMENAGOGUES *.

VEGETABLE.

- Ranunculaceæ.
  - Helleborus niger.
- Rutaceæ.
  - Ruta graveolens.
- Guttiferæ.
  - Gambogia.
- Cruciferæ.
  - Sinapis alba—*Semina.*
- Umbelliferæ.
  - Gummi fœtida.
- Rubiaceæ.
  - Rubia tinctorum—*Radix.*
- Valerianeæ.
  - Valeriana officinalis—*Radix.*
- Compositæ—corymbiferæ.
  - Artemisia Abrotanum—*Herba.*
  - Tanacetum vulgare—*Herba.*
- Aristolochiæ.
  - Aristolochia Serpentaria.
- Coniferæ.
  - Juniperis Sabina—*Folia.*
- Irideæ.
  - Crocus sativus—*Stigmata.*
- Liliaceæ.
  - Aloës Socotorina—*Extractum.*

IX. OFFICINAL DIURETICS †.

1. VEGETABLE.

a. *Stimulant.*

- Terebinthaceæ.
  - Gambogia.
- Lomentaceæ.
  - Copaifera officinalis—*Terebinthina.*
  - Spartium Scoparium—*Summitates.*
- Myrti.
  - Melaleuca Leucadendron—*Oleum volatile.*
- Coniferæ.
  - Juniperus communis—*Oleum volatile.*
  - Pinus sylvestris—*Oleum volatile.*

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* The existence of this class has been altogether doubted; and when we consider the great variety of causes upon which the defect of the menstrual secretion may depend, it may be granted that the power of exciting the secretion in all cases is not possessed by any substance. But upon the same grounds, the existence of many other classes of medicines might be denied. A better founded objection would be, that the uterus is not an organ intended for the elimination of foreign matters, which therefore seldom reach it. Increased action may be excited in it by any stimulus directly applied, as electricity, friction, or heat; or by sympathy, by stimulating the rectum, bladder, and neighbouring parts.

† The action of diuretics, and indeed of internal medicines in general, has been much elucidated by the experiments of recent physiologists, especially of

b. *Narcotic.*

COMPOSITÆ—CICHORACEÆ.
  Lactuca virosa—*Succus concretus.*
  Leontodon Taraxacum—*Radix.*

SOLANEÆ.
  Nicotiana Tabacum—*Folia.*
PERSONATÆ.
  Digitalis purpurea—*Folia.*
  Gratiola officinalis—*Herba.*

Dr Wohler and Dr Stehberger. They have ascertained more precisely than had been previously done, the state in which, and the time at which, various substances appear in the urine after being taken into the stomach.

1. *Substances which pass off by Urine unchanged.*

Carbonate of potass.
Nitrate of potass.
Chlorate of potass.
Sulpho-cyanate of potass.
Hydrosulphuret of potass.
Ferro-cyanate of potass.
Silicate of potass.
Tartrate of nickel and potass.
Borax.
Muriate of barytes.
Astringency of uva ursi.

Colouring Principles.

Indigo.
Madder.
Rhubarb.
Gamboge.
Logwood.
Red radishes.
Mulberry.
Black Cherry.
Cassia fistula.
Elder rob.

Odorous principles somewhat altered.

Oil of Turpentine.
— of Juniper.
Valerian.
Saffron.
Assafœtida.
Garlic.
Castor.
Opium.

The narcotic principle of the Agaricus muscarius.

2. *Substances which pass in a state of combination.*

Sulphur, as sulphuric acid and sulphuretted hydrogen.
Iodine, as hydriodic acid.

Oxalic Tartaric Gallic Succinic Benzoic	acids appear in combination with an alkali.

3. *Substances which pass in a decomposed state.*

Tartrate Citrate Malate Acetate	of Potass or Soda	are changed into the Carbonate of the same alkali.

Hydro-sulphuret of Potass, changed in a great measure into the sulphate of potass.

Oxy-ferro-cyanate of Potass, changed into the Ferro-cyanate of potass.

4. *Substances which did not re-appear in the Urine.*

Iron.
Lead.
Alcohol.
Sulphuric ether.
Dippel's oil.
Musk.
Cochineal.
Litmus
Sap green.
Alkanet.
Quassia.
Camphor.

Carbonic acid not increased in quantity.

Madder and Indigo appeared in the urine 15 minutes after they were taken into the stomach; Rhubarb and Gallic Acid in 20; Logwood in 25; Vaccinium myrtillus in 30; Black Cherries and Uva Ursi in 45; pulp of Cassia fistula in 55; Ferro prussiate of Potass in 66; and Elder rob in 75.

Liliaceæ.
Scilla maritima—*Bulbus.*

Colchicaceæ.
Colchicum autumnale–*Bulbus.*

2. ANIMAL.

Cantharis vesicatoria.

3. INORGANIC.

a. *Stimulant.*

1. Volatile.
   Alcohol.
   Spiritus ætheris nitrosi.

2. Fixed.
   Murias ferri.
   ——— hydrargyri.
   Pilula hydrargyri.
   Tartras antimonii.

b. *Refrigerant.*

1. Rendering the urine acid.
   Acida mineralia diluta.
2. Rendering the urine alkaline.
   Potassæ carbonas.
   ——— supercarbonas.
   ——— acetas.
   ——— tartras.
   ——— supertartras.
   Sodæ carbonas.
   —— supercarbonas.
   Sodæ et potassæ tartras.
3. Not rendering the urine either acid or alkaline.
   Potassæ nitras.
   ——— chloras.
   ——— hydrosulphuretum.
   ——— ferro-cyanas.
   Sodæ subboras.
   Barytæ murias.

X. OFFICINAL SIALAGOGUES *.

VEGETABLE.

Hesperideæ.
Citrus Aurantium — *Fructus immaturi— Curaçao.*
Cruciferæ.
Cochlearia Armoracia—*Radix.*
Terebinthaceæ.
Pistacia Lentiscus—*Resina—Mastiche.*
Polygaleæ.
Polygala Seneka—*Radix.*
Leguminosæ.
Pterocarpus Draco—*Resina.*
Myrti.
Myrtus Pimenta—*Fructus.*
Eugenia caryophyllata—*Fructus.*

Umbelliferæ.
Angelica Archangelica–*Radix.*
Compositæ—corymbiferæ.
Anthemis Pyrethrum—*Radix.*
Solaneæ.
Nicotiana Tabacum—*Folia.*
Capsicum annuum—*Fructus.*
Laurineæ.
Laurus Cassia—*Fructus immaturi.*
Myristiceæ.
Myristica moschata—*Fructus.*
Thymaleæ.
Daphne Mezereon—*Cortex.*
Urticeæ.
Piper nigrum—*Baccæ.*

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[*] Sialagogues, besides the increased flow of saliva, cause also an increased secretion of mucus from the membrane of the mouth and fauces. Mercury is the only substance which produces salivation through the medium of the circulation; but every acrid substance chewed, or applied directly to the orifices of the salivary ducts, acts as a topical sialagogue. The stimulus of food received into the stomach, and even the sight or expectation of food, produces an increased secretion of saliva.

URTICEÆ.
Piper longum—*Fructus.*
DRYMYRRHIZÆ.
Amomum Zingiber—*Radix.*
——— Cardamomum—*Fructus.*
IRIDEÆ.
Iris Florentina—*Radix.*
JUNCEÆ.
Acorus Calamus—*Radix.*

INORGANIC.

Hydrargyrum.

XI. OFFICINAL EPISPASTICS; INCLUDING RUBEFACIENTS AND ESCHAROTICS.

VEGETABLE.

RANUNCULACEÆ.
Delphinium Staphisagria—*Semina.*
Ranunculus acris—*Herba.*
RUTACEÆ.
Ruta graveolens—*Herba.*
Guaiacum officinale—*Oleum.*
CRUCIFERÆ.
Sinapis alba—*Seminum pulvis.*
Cochlearia Armoracia—*Radix.*
TEREBINTHACEÆ.
Amyris elemifera—*Resina.*
MYRTI.
Melaleuca Leucadendron—*Oleum Cajeput.*
Eugenia caryophyllata—*Fructus oleum volatile.*
UMBELLIFERÆ.
Gummi-resina Ammoniacum.
Gummi-resina Sagapenum.
Bubon Galbanum—*Gummi-resina.*
Pastinaca Opoponax—*Gummi-resina.*
COMPOSITÆ—CORYMBIFERÆ.
Anthemis Pyrethrum—*Radix.*
SOLANEÆ.
Capsicum annuum—*Baccæ.*
LAURINEÆ.
Laurus Cinnamomum—*Oleum.*
——— Sassafras—*Oleum.*
——— Camphora—*Camphora.*
THYMALEÆ.
Daphne Mezereon—*Cortex.*
EUPHORBIACEÆ.
Euphorbia officinarum—*Resina.*
URTICEÆ.
Piper nigrum—*Baccæ.*
—— longum—*Fructus.*
CONIFERÆ.
Pinus Larix—*Terebinthina—Oleum terebinthinæ—Resina.*
Juniperus Sabina—*Folia—Oleum volatile.*
AROIDEÆ.
Arum maculatum—*Radix recens.*
DRYMYRRHIZÆ.
Zingiber officinale—*Radix.*
LILIACEÆ.
Allium sativa—*Bulbus.*
——— Cepa—*Bulbus.*

ANIMAL.

Cantharis vesicatoria.

INORGANIC.

Alcohol fortius.
Æther sulphuricus.
Acida mineralia fortiora.
Acidum aceticum fortius.
Ammonia.
Potassa.
Calx.
Calcis murias.
Argenti nitras.
Hydrargyri murias.
———— oxidum rubrum.
Cupri sulphas.

Cupri subacetas.
Zinci sulphas.

Antimonii tartras.
——— murias.

XII. OFFICINAL CARMINATIVES.

UMBELLIFERÆ.
- Anethum Fœniculum—*Semina.*
- ——— graveolens—*Semina.*
- Angelica archangelica—*Radix.*
- Carum Carui—*Semina.*
- Coriandrum sativum—*Semina.*
- Cuminum Cyminum—*Semina.*
- Daucus Carota—*Semina.*
- Pimpinella Anisum—*Semina.*

LABIATÆ.
- Hyssopus officinalis—*Herba.*
- Lavandula vera—*Flores.*
- Melissa officinalis—*Herba.*
- Mentha Piperita—*Herba.*
- ——— Pulegium—*Herba.*
- ——— viridis—*Herba.*
- Origanum Majorana—*Herba.*
- ——— vulgare—*Herba.*
- Rosmarinus officinalis—*Herba.*
- Salvia officinalis—*Herba.*

XIII. OFFICINAL SPICES AND ACRID STIMULI.

MAGNOLIACEÆ.
- Drymis aromatica—*Cortex Winteri.*

RUTACEÆ.
- Guaiacum officinale—*Lignum—Cortex—Resina.*
- Ruta graveolens—*Herba.*

HESPERIDEÆ.
- Citrus aurantium—*Cortex fructûs.*
- ——— medica—*Cortex fructûs.*

MELIACEÆ.
- Canella alba—*Cortex.*

POLYGALEÆ.
- Polygala Senega—*Radix.*

MYRTI.
- Melaleuca Leucadendron—*Oleum Cajeputi.*
- Myrtus Pimenta—*Fructus.*
- Eugenia caryophyllata—*Fructus.*

COMPOSITÆ—CORYMBIFERÆ.
- Anthemis Pyrethrum—*Radix.*
- Arnica montana—*Radix—Flores—Folia.*

SOLANEÆ.
- Capsicum annuum—*Fructus.*

LAURINEÆ.
- Laurus Cinnamomum—*Cortex.*
- ——— Cassia—*Cortex.*
- ——— nobilis—*Baccæ.*

LAURINEÆ.
- Laurus Sassafras—*Lignum.*
- ——— Camphora—*Camphora.*

MYRISTICEÆ.
- Myristica moschata—*Nux—Macis.*

ARISTOLOCHIÆ.
- Aristolochia Serpentaria—*Radix.*
- Asarum Europæum—*Folia.*

EUPHORBIACEÆ.
- Croton Eleutheria—*Cortex.*

MONIMIÆ.
- Dorstenia Contrayerva—*Cortex.*

URTICEÆ.
- Piper nigrum—*Fructus.*
- ——— longum—*Fructus.*
- ——— Cubeba—*Fructus.*

CONIFERÆ.
- Juniperus Sabina—*Folia.*

AROIDEÆ.
- Arum maculatum—*Radix.*

DRYMYRRHIZÆ.
- Zingiber officinale—*Radix.*
- Amomum Zedoaria—*Radix.*
- Amomum Cardamomum—*Fructus.*

JUNCEÆ.
- Acorus Calamus—*Radix.*

XIV. OFFICINAL TONICS.

I. VEGETABLE.

Menispermeæ.
  Menispermum palmatum—*Radix Colombæ.*
Simarubeæ.
  Quassia excelsa—*Cortex.*
  Quassia Simaruba—*Cortex.*
Rutaceæ.
  Bonplandia trifoliata—*Cortex Angusturæ.*
Rubiaceæ.
  Cinchona officinalis—*Cortex.*
Compositæ—corymbiferæ.
  Anthemis nobilis—*Flores.*

Compositæ—corymbiferæ.
  Artemisia Absinthium—*Herba.*
  ——— Santonica—*Summitates.*
  Tanacetum vulgare—*Herba.*
——— cynarocephalæ.
  Cnicus benedictus—*Herba.*
Gentianeæ.
  Gentiana lutea—*Radix.*
  Menyanthes trifoliata—*Herba.*
  Spigelia Marilandica—*Herba.*
  Chironia Centaurium—*Summitates.*

II. MINERAL.

Saline.

Murias sodæ.
——— calcis.
Murias barytæ.

Metallic.

Arsenicum.
Ferrum.
Zincum.
Cuprum.
Argentum.
Stannum.
Bismuthum.

XV. OFFICINAL ASTRINGENTS.

VEGETABLE.

Meliaceæ.
  Swietenia Mahagoni—*Cortex.*
  ——— febrifuga—*Cortex.*
Acerineæ.
  Æsculus Hippocastanum—*Cortex.*
Polygaleæ.
  Krameria triandra—*Radix Rhataniæ.*
Leguminosæ.
  Acacia vera—*Succus spissatus.*
  Acacia Catechu—*Extractum.*
  Hæmatoxylon Campechianum—*Extractum ligni.*
  Pterocarpus erinaceus—*Succus spissatus, Kino verum.*
Rosaceæ.
  Agrimonia Eupatoria—*Herba.*
  Geum urbanum—*Radix.*

Rosaceæ.
  Rosa Gallica—*Petala.*
  Tormentilla erecta—*Radix.*
Salicariæ.
  Lythrum Salicaria—*Radix.*
Myrti.
  Punica Granatum—*Cortex radicis—Flores—Cortex (Epicarpium) fructus.*
  Eucalyptus resinifera—*Succus spissatus,* varietas *Kino.*
Rubiaceæ.
  Cinchona rubra—*Cortex.*
  Rubia tinctorum—*Radix.*
Ericineæ.
  Arbutus Uva-ursi—*Folia.*
Polygoneæ.
  Polygonum Bistorta—*Radix.*
  Rheum—*Radix.*

- Polygoneæ.
  - Rumex aquaticus—*Radix.*
- Laurineæ.
  - Laurus Cinnamomum—*Cassia—Cortex.*
- Amentaceæ.
  - Quercus Robur.—*Cortex.*
- Amentaceæ.
  - Quercus infectoria—*Gallæ.*
  - Salix alba, fragilis, Caprea—*Cortex.*
  - Ulmus campestris—*Cortex.*
- Coniferæ.
  - Pinus Larix—*Cortex.*

Mineral Styptics.

Acetas plumbi.
Sulphas cupri.
——— zinci.
Murias ferri.
Nitras argenti.

Saline Styptics.

Acidum sulphuricum.
——— aceticum.
Alumen.

XVI. OFFICINAL RESINOUS STIMULI.

- Rutaceæ.
  - Guaiacum officinale—*Resina.*
- Terebinthaceæ.
  - Amyris Gileadensis — *Terebinthina.*
  - Pistacia Lentiscus—*Resina.*
  - ——— Terebinthus — *Terebinthina.*
  - Toluifera balsamum — *Balsamum.*
- Leguminosæ.
  - Copaifera officinalis—*Terebinthina.*
  - Myroxylon peruiferum—*Balsamum.*
- Ebenaceæ.
  - Styrax officinale—*Balsamum—Resina.*
  - ———-Benzoin—*Balsamum—Resina.*
- Euphorbiaceæ.
  - Euphorbia officinarum-*Resina.*
- Coniferæ.
  - Pinus; plurimæ species.
    - *Terebinthina vulgaris.*
    - ——— *Veneta.*
    - *Balsamum Canadense—Terebinthina.*
    - *Resina sponte concreta.*
  - Juniperus Lycia—*Olibanum.*

XVII. OFFICINAL FŒTID STIMULI—ANTISPASMODICS OF AUTHORS.

VEGETABLE.

- Umbelliferæ.
  - Bubon Galbanum—*Gummi-resina.*
  - Ferula Assafœtida—*Gummi-resina.*
  - Pastinaca Opoponax—*Gummi-resina.*
- Umbelliferæ.
  - Gummi-resina Ammoniacum.
  - ——— Sagapenum.
- Valerianeæ.
  - Valeriana sylvestris—*Radix.*
- Irideæ.
  - Crocus sativa—*Stigmata.*

ANIMAL.

Moschus.
Castoreum.

INORGANIC.

Petroleum.
Empyreumatic Oils—*Animal—Dippel's oil—Burnt feathers—Oil of Amber.*
Volatile Oils—*Oil of Turpentine—Oil of Cajeput.*

There are other substances which act as Antispasmodics, upon different principles:

Narcotics—as *Opium.*
Intoxicators—as *Ether.*
Tonics—as *Wormwood.*
Mineral Tonics—as *Copper—Silver—Zinc.*

XVIII. OFFICINAL VOLATILE PUNGENT STIMULI,

ONE ORDER OF ANTISCORBUTICS.

CRUCIFERÆ.
  Cardamine pratensis—*Herba.*
  Cochlearia Armoracia—*Radix.*
  ——— officinalis—*Herba.*
  Sinapis alba—*Semina.*
  ——— nigra—*Semina.*
LILIACEÆ.
  Allium sativum—*Bulbus.*
  ——— Cepa—*Bulbus.*
  ——— Porrum—*Radiculæ.*

There are other substances which are also useful in scurvy, but they operate upon very different principles.

Acid Fruits—as *Lemons.*
Acid Vegetables—as *Sorrel.*
Bitter Vegetables—as *Dandelion.*
Spices—as *Winter's Bark.*
Fresh Animal Food.

XIX. OFFICINAL REFRIGERANTS *.

VEGETABLE †.

HESPERIDEÆ.
  Citrus Aurantium—*Fructus succus.*
  ——— medica—*Fructus succus.*
GERANIACEÆ—OXALIDEÆ.
  Oxalis Acetosella.
LEGUMINOSÆ.
  Tamarindus Indica—Legumen.
ROSACEÆ.
  Prunus domestica—*Fructus.*
  Rosa canina—*Fructus.*
COMPOSITÆ—CICHORACEÆ.
  Lactuca sativa—*Herba.*
POLYGONEÆ.
  Rumex Acetosa—*Folia.*
URTICEÆ.
  Morus nigra—*Fructus.*

INORGANIC.

Dilute Mineral Acids, especially the Sulphuric.
All Vegetable Acids.

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* The most powerful, if not the only, refrigerant is cold; cold air, cold bath, cold drink; all of which not only abstract heat from the body, but have a tendency to reduce the calorific function. But the substances commonly considered as refrigerants act by evacuation or by inducing nausea.

† There are many other subacid fruits, which are used as refrigerant articles of diet, although not officinal; also some animal products, as butter-milk, and acid whey.

All Acid Salts, as supersulphate of potass and alumina, and supertartrate of potass.
Neutral Salts, largely diluted, especially
  Nitrate of Potass.
  Subborate of Soda.
Some Metallic Salts,
  Acetate of Lead.
  Tartrate of Antimony.

XX. OFFICINAL NARCOTICS.

VEGETABLE.

RANUNCULACEÆ.
  Aconitum Napellus—*Folia.*
  Helleborus niger—*Herba.*
  Delphinium Staphisagria — *Semina.*
MENISPERMEÆ.
  Menispermum Cocculus—*Semina.*
PAPAVERACEÆ.
  Opium.
  Papaver somniferum—*Capsulæ.*
  ——— Rhæas—*Petala.*
TEREBINTHACEÆ.
  Rhus Toxicodendron—*Folia.*
ROSACEÆ.
  Amygdalus communis—*Amygdalæ amaræ.*
  ——— Persica—*Folia.*
  Prunus Laurocerasus—*Folia.*
UMBELLIFERÆ.
  Conium maculatum—*Folia.*
COMPOSITÆ—CICHORACEÆ.
  Lactuca virosa—*Succus concretus.*
  ——— sativa — *Succus concretus.*
STRYCHNEÆ.
  Strychnos Nux vomica—*Nuces.*
SOLANEÆ.
  Atropa Belladona—*Folia.*
  Datura Stramonium—*Herba—Capsulæ—Semina.*
  Hyoscyamus niger—*Folia.*
  Nicotiana Tabacum—*Folia.*
  Verbascum Thapsus—*Folia.*
PERSONATÆ.
  Digitalis purpurea—*Folia.*
  Gratiola officinalis—*Herba.*
LAURINEÆ.
  Laurus Camphora—*Camphora.*
  Crocus sativus—*Stigmata.*
COLCHICACEÆ.
  Colchicum autumnale—*Bulbus.*

INORGANIC.

Acidum hydrocyanicum.
Acidum oxalicum.

XXI. OFFICINAL ACIDS.

Acidum sulphuricum.
——— nitricum.
——— muriaticum.
——— aceticum.
Acidum citricum.
——— tartaricum.
——— benzoicum.
——— succinicum.

XXII. OFFICINAL ALKALINES.

Potass.
Soda.
Ammonia.
Lime.
Magnesia.
  and their combinations with carbonic acid.

Pharmacopœias published by authority in the principal States of Europe and America, with the titles of some of the earliest *.

BRITISH EMPIRE.

Pharmacopœia Collegii Regalis Medicorum Londinensis. Lond. 8vo, 1824, pp. 205.

Pharmacopœia Collegii Regii Medicorum Edinburgensis. Edin. 8vo, 1817, pp. 263.

Pharamcopœia Collegii Medicorum Regis et Reginæ in Hibernia. Dublinii, 8vo, 1826, pp. 296.

Pharmacopœia in usum Nosocomii Regii Edinburgensis, pp. 8vo. Edinburgi, 1826.

FRANCE.

Codex Medicamentarius, sive Pharmacopœia Gallica, editus a Facultate Medica Parisiensi. 4to maj. 1818, pp. 405.

Formulaire Pharmaceutique à l'Usage des Hospices Militaires. Paris, an. xiii.

Code Pharmaceutique à l'Usage des Hospices Civiles, &c. par ordre du Ministre du l'Interieur, par A. Parmentier. Paris, an. viii.

Pharmacopée de Lyon. 4to, 1778.

Codex Medicamentorum, seu Pharmacopœia Tolosana, auct. F. P. Purpani. Tolos. 4to, 1648.

RUSSIA.

Pharmacop. Rossica, rec. opus plane novum. Petrop. 1803, 4to.

Pharmacop. Navalis Rossica, ed. ab And. Bacheracht. Petrop. 8vo, 1784.

Pharmacop. Castrens. Ruthena, auct. Jac. Wylie, Equit. Petrop. editio tertia, gr. 8vo, 1818, pp. xxxii. & 316.

Pharmacopœia regni Poloniæ. Varsoviæ, 8vo maj. 1817.

Pharmacopœia Fennica. Aboæ, 8vo maj. 1819.

DENMARK.

Pharm. Danica, Regia auctoritate, a Collegio Sanitatis Regio Medico-Chirurgico Haffniensi conscripta. Hafn. 1805, 4to, pp. 184, cum Indicibus.

Pharmacopœia Militaris. 8vo, Hafn. 1818.

SWEDEN.

Pharmacopœia Suecica, Holm. 1817, 4to maj. pp. xviii. & 166.

Pharmacop. Militaris, Navalis, et eorum usui accommodata qui impensis publicis curantur. Holm. 8vo, 1789.

BATAVIA.

Pharmacopœia Batava, recusa cum notis et additamentis Medico-Pharmaceuticis, &c. edid. Jo. Frid. Niemann. Lips. 2 tom. 8vo maj. 1811.

Pharmacopée Belgique. 8vo, La Haye, 1829, pp. 409.

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* The French translators seem to have overlooked the notice, that this list contained, as a matter of history, the titles of some of the *earliest* Pharmacopœias, when they represent those of Lyons, Toulouse, Nurenberg, Cologne and Augsburg, and the Antidotaries of Florence and Rome as obsolete; also that it is my avowed object to confine my list to authorised Pharmacopœias; for most of the additions they propose are Systems and Manuals of Pharmacy, works excellent in themselves, but not entitled to be inserted here.

GERMANY.

Pharmacopœia in usum nosocomii milit. Wurceburgensis. 4to, Würzburg, 1816.

Pharmacopœia Bavarica, jussu Regio. Edita 8vo, Monachii, 1822, pp. xvi. & 332.

Pharmacopœia Borussica, editio iv. pp. 387, cum Appendice, pp. Berol. 1827,

Pharmacopœia Carstensis Borussica, edit. nova, auct. Görcke et Hermbstädt, 12mo, Berol. 1823.

Pharmacopœia Austriaca. Editio 3tia emendata. Vindob. 1820, 8vo maj. pp. 166.

Pharmacopœia Austriaco-Provincialis. Vien. 1794, 8vo, pp. viii. & 195.

Pharmacop. Austriaco-Castrensis. Vindob. 8vo, 1800.

Pharmacopœia Saxonica, jussu Regio et auctoritate publica edita. Dresdæ, 8vo maj. 1820, pp. 416.

Pharmacopœia Hannoverana. 8vo maj. Hannoveræ, 1819, pp. xvi. & 396.

Pharmacopœia Wirtembergica. Stuttg. 1798.

Pharmacop. Palatina. Manheim, 4to, 1803.

Dispensatorium Hassiacum, cur. Piderit. Cassell, 1806. Additamenta, 1816.

Pharmacopœia Pauperum in usum Instituti Clinici Hamburgensis. Hamburg. 8vo, 1804.

Pharmacop. Oldenburgica, cum gratia et privilegio, (auct. Gramberg.) Oldenburgi, 8vo, 1801, pp. 250.

Pharmacop. in usum officinarum Reipublicæ Bremensis, (auct. Treviranus & Heineken.) 1792.

Dispensatorium Lippiacum, genio moderno accommodatum, auctoritate Collegii Medici redigit Jo. Ch. Fr. Scherf. Lemgo, vol. i. 1792; vol. ii. 1794.

Dispensatorium Fuldense, à F. A. Schlereth. edit. ii. Francof. 1791.

Dispensatorium Pharmaceuticum Ratisbonense. Fol. 1727.

Pharmacop. Argentoratensis. Fol. 1757.

Dispensatorium Pharmacoporum omnium, auct. Val. Cordo, nunc vera opera et studio Medici Reipublicæ Norimbergensis publ. Norimb. 1592, fol.

Pharmacopœia Augustana. Aug. Vindel. 1764.

Dispensatorium usuale pro Pharmacopœiis inclytæ Reipubl. Coloniensis. Col. 8vo, 1565.

SWISSERLAND.

Pharmacop. Genevensis, auct. C. G. Dunant, L. Odier et De la Roche. Gen. 8vo, 1780.

Manuale Pharmaceuticum in usum minorum urbium. Basil, 8vo, 1779.

Pharmacop. Helvetica. 1771, 2 vols. fol.

ITALY.

Pharmacopea Ferrarese, del dott. Antonio Campana. Firenz. edit. 7ma, 1821, pp. 423.

Formulario Farmaceutico. Genova, 1791, 8vo.

Formulario Farmaceutico per uso dell Ospedale di Pammatone. Genov. 8vo, 1798.

Codice Pharmaceutico per lo stato della ser. Rep. di Venezia, compilato per ordine del eccellentiss. magistrato della sanita. Padov. 4to maj. 1790.

Ricettario Fiorentino, nuovamente compilato e redotto all' uso moderno, diviso in due parte. Firense, 1789, 4to, pp. 350.

Bononiensis Collegii Medicorum Antidotarium, editum anno 1783. Editio novissima, in qua locupletissimus adjectus est Index Virum ac Usuum Medicamentorum. Venet. 4to, 1783.

Pharmacop. Sardoa, ex selectioribus codicibus, optimisque scriptoribus collecta, in unum corpus digesta, ac nunc primum edita, a Jac. Jn. Pedemontano August. Taurin. 4to, 1773.

Pharmacop. Messenensis. Mess. fol. 1629.

Antidotario Romano commentato de Pet. Castello. Rom. 4to, 1629.

Pharmacopœia Bergamensis, rationem componendi medicamenta usitatoria complectens, ed. P. Lanci et. P. Maselli. Berg. 4to, 1580.

Ricettario de dottori del Arte e di Medicina dell Collegio Fiorentino all' instanza de Signori Conculi della Universita cett. Fiorenze, fol. 1498. Recus. ibid. 1567, 1597.

SPAIN.

Pharmacop. Madritensis, protomedicatus auctoritate elaborata. 4to, 1739.

Pharmacop. Catalana. 4to, 1686.

Pharmacop. Valentiniansis. Valenc. 4to, 1651.

Pharmacop. Hispana. Editio altera, Regis jussu et impensis. Madrit. 8vo, 1798.

PORTUGAL.

Pharmacopeia Geral para o Reina e Dominios de Portugal, publicada por ordem da Rainha Fidelissima Maria I. 8vo, Lisbon, 1794, tomo i. Elementos do Pharmacies, pp. 228; tomo ii. Medicamentos simplices, preparandos e compositos, pp. 248.

AMERICA.

The Pharmacopœia of the United States of America, 1820. By the authority of the Medical Societies and Colleges. 8vo, Boston, Dec. 1820, pp. 272.

The Pharmacopœia of the Massachusett's Medical Society. Boston, 8vo, 1808, pp. 272.

Mr Frederick Fleischer, bookseller in Leipsic, is publishing a Collection of the Pharmacopœias of the different states of Europe, under the title of CODEX MEDICAMENTARIUS EUROPÆUS. Of this work, seven sections have appeared, and some have been reprinted.

Sectio prima.—Codex Medicamentarius Britanniæ, 3 vol.
  Vol. i. Pharmacopœia Londinensis, editio nova, 1821, pp. 128.
  Vol. ii. Pharmacopœia Edinburgensis, editio nova, 1822, pp. 152.
  Vol. iii. Pharmacopœia Dublinensis, 1818, pp. 148.

Sectio secunda.—Pharmacopœia Gallica, 1819, pp. ccxx. & 419.

Sectio tertia.—2 vol.
  Vol. i. Pharmacopœia Suecica, 1821, pp. 224.
  Vol. ii. Pharmacopœia Danica, 1821, pp. 228.

Sectio quarta.—Pharmacopœia Batava, 2 vol. Editio 2da, emendata et aucta, 1824.
  Vol. i. Pharmacopœias continens, cum Notis, pp. 728.
  Vol. ii. Additamenta, et Indicem, pp. 805.

Sectio quinta.—2 vol. 1821.
  Vol. i. Pharmacopœia Rossica et Fennica, pp. 376.
  Vol. ii. Pharmacopœia Regni Poloniæ, pp. 199.

Sectio sexta.—2 vol. 1822.
  Vol. i. Pharmacopœia Hispanica.
  Vol. ii. Pharmacopœia Lusitanica.

Sectio septima.—1 vol. Litteratura Pharmacopœarum collecta à Doctore Alex. Nicol. A. Scherer, Societatis Pharmaceuticæ Petropoli florentis Directore, &c. &c. 1822, pp. 132.

To complete the work, the Pharmacopœias of Germany and Italy are wanting. These are, however, so numerous, that the republication of the whole would be improper. The publisher therefore proposes to condense them into two sections, that for Germany having as its basis the fourth edition of the Prussian Pharmacopœia, and the work will be concluded by an Introduction and Conspectus of the whole by Dr Scherer.

PART II.

MATERIA MEDICA.

EVERY substance employed in the cure of disease, whether in its natural state, or after having undergone various preparations, belongs to the Materia Medica, in the extended acceptation of the words. But in most Pharmacopœias, the materia medica is confined to simples, and to those preparations which are seldom prepared by the apothecary himself, but commonly purchased by him, as articles of commerce, from druggists and chemical manufacturers.

Systematic authors on this branch of medical knowledge have bestowed much pains in contriving scientific arrangements of these articles. Some have classed them according to their natural resemblances; others according to their active constituent principles; and others according to their real or supposed virtues. Each of these arrangements has its particular advantages. The first will probably be preferred by the natural historian, the second by the chemist, and the last by the physiologist. But every scientific classification is liable to particular objections. Accordingly, in the Pharmacopœias published by the Colleges of Physicians of London, Dublin, and Edinburgh, the articles of the materia medica are arranged in alphabetical order; and the same plan is now almost universally adopted. I have also followed it, subjoining to the name of each article, admitted by any of the British colleges, a short view of its natural, medical, and pharmaceutical history; and in thus forming a Dictionary of Materia Medica, I have generally employed the nomenclature of the Edinburgh College *.

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* A judicious French critic, who has censured me for not having adopted a scientific classification, must have overlooked this notice of my object. If any argument were wanting to support the advantages of an alphabetical arrangement, I might refer to the excellent *Dictionaire de Drogues* by MM. Chevallier, Richard and Guillemin, in 5 vols 8vo, Paris 1829, and the no less valuable *Dictionaire Universel de Matière Medicale et de Therapeutique Generale*, by Dr Merat and De Lens, of which the first volume has just been published.

ABIETIS RESINA. *Lond.* See PINUS ABIES.

ABSINTHIUM VULGARE. *Lond. & Dub.* See ARTEMISIA.

ACACIA. Willd. *Lond. Ed.*

Polygamia Monœcia, Linnæi Species Plantarum, edit. Willdenow, *g.* 1902.—*Monadelphia Polyandria, g.* 1655, Persoon; *g.* 1471, Sprengel.—Nat. ord. *Lomentaceæ* Linn.; *Leguminosæ,* Sect. *Mimosæ,* Jussieu.

Sp. 161. Spr. ACACIA VERA. *Lond. Ed.*

Sp. 160. Spr. ACACIA ARABICA. *Ed.*
Gum Mimosa.

Officinal.—The gum. Gum-Arabic.
GUMMI. *Dub.* ACACIÆ ARABICÆ GUMMI. *Ed.* ACACIÆ GUMMI, *Lond.* *.

GUM ARABIC is a concrete juice, which exudes from various trees of moderate size, natives of the sandy deserts of Africa, Arabia, and other parts of Asia. The genus to which they belong has been named, at different times, Mimosa and Acacia; nor are authors agreed about the species from which the several varieties of commercial gum are obtained. A good gum may be procured from other species of Acacia than those named, and from many other trees, such as the Feronia elephantum, Celastrus albens, Swietenia febrifuga, Melia azadirachta, and different species of Terminalia. It is remarkable, that the barks of all the trees which furnish this bland mucilaginous juice are highly astringent; that of the Acacia itself is used in India for tanning; and in our country, the cherry and plum trees, which sometimes yield gum, have very astringent barks.

Hayne, in his tenth volume, has described the gum trees more accurately than his predecessors, having derived much information on this subject from Ehrenberg. Gum is produced by various species of *Acacia,* viz. *Gummifera, Ehrenbergiana, Senegal, Seyal, Arabica, tortilis, Karroo* and *vera.* Ehrenberg saw the Bedouins engaged in gathering the gum in Egypt; that got from *A. Ehrenbergiana*, they called *Samle*; that from *A. Seyal*, was *Sejal*; and that from *A. tortilis*, they call *Aohle*. He also remarked, that different kinds of gum are got from the same species. The juice flows out from the tree sometimes as if frothy, sometimes dense, and clear or dark in colour, and the masses in which it concretes are of different forms and sizes. Hence it happens, that the kinds which occur in commerce are not always got from particular species, but that, wherever gum is collected, it must be sorted to form the different kinds found in commerce.

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* *Synonimes.* Gomme Arabique, (*Fr.*) Gomma Arabica, (*It.*) Das Arabische gummi, (*Ger.*) Vullãm pisin, (*Taur.*) Kapittha, (*Sans.*) Kavit ka gond, (*Duk.*) Samagh Arebee, (*Arab.*) Jewol latoo, (*Cyng.*)

The synonimes in various languages were first inserted in an edition of this Dispensatory published by Dr Coxe, under the title of The American Dispensary, Philadelphia, 1806. In the present edition, I have been induced, by frequent solicitation, to add them. For those of the modern European languages I am responsible; and I am indebted to Dr W. Ainslie for the Eastern synonimes, which I have taken the liberty to transcribe from his valuable Materia Indica, London, 1826.

Originally all the gum in commerce was brought from Upper Egypt, and the adjacent countries, to the port of Marseilles, from which it was distributed over Europe. For a long time, two kinds only were distinguished, the coloured and the white, which came from Arabia, under the names of *Gomme Gedda* and *Gomme Turique*, because it was believed that they came from Gidda and Tor, two ports on the Red Sea. In the time of Haselquist, (1750,) gum, called *Thus*, pellucid and colourless, was collected in vast quantities in Arabia Petræa, near the foot of mount Sinai, and exported from the neighbouring port of Thor, while Gum Arabic more coloured was exported from Suez.

It was not until the beginning of the seventeenth century that the Dutch made the gum of Senegal known in Europe. After the French got possession of that river, they directed their attention to the collection of gum, and rendered it an important object of commerce.

M. Adanson examined the gum trees of West Africa with great care. They amount to forty in number; but the three great forests which supply the Senegal market consist chiefly of two kinds; one called *Vereck*, which produces a white gum, and another, called *Nebueb*, which yields a red gum. About the middle of November, that is, after the rainy season, which begins early in July, a gummy juice exudes spontaneously from the trunk and principal branches. In about fifteen days, it thickens in the furrow, down which it runs, either in a vermicular shape, or more commonly in the form of round or oval tears, about the size of a pigeon's egg, of different colours, as they belong to the white or red gum tree. About the middle of December, the Moors encamp on the borders of the forest, and the harvest lasts six weeks. The gum is packed in very large sacks of tanned leather, and brought on camels and bullocks to certain ports, where it is sold to the French and English merchants. About 1787, the annual quantity purchased by the former was about 800,000 pounds, and by the latter 400,000, according to the information of M. Golberry, which is exported from Portendyk.

Mr Jackson, in his account of the Empire of Morocco, informs us, that from Mogodor they export two sorts of gum, one the common Gum Arabic, the produce of Morocco, and called Barbary Gum; the other finer, called Gum Soudan, or Senegal, brought from Timbuctoo by the caravans. He also says, that the gum called Morocco or Barbary Gum is produced from a thorny tree called *Atalleh*, having leaves similar to the juniper. (The Arabians, according to M. Caillaud, give the name of *Talleh* to the A. gummifera.) It yields most gum during the hot and parching heat of July and August; and the hotter the weather, and the more sickly the tree appears, the more gum it yields. A wet winter and a mild summer are unfavourable to gum.

Dr Roxburgh has described the *Mimosa Arabica* of Bengal as capable of furnishing employment to the natives in collecting its gum; but it would appear that the greater part of the East Indian gum is obtained from the *Feronia Elephantum.*

There are two kinds of gum found in the shops of this country, and often sold promiscuously, but distinguished in commerce by the names of Gum Arabic, and Gum Senegal, or East-India gum. *Gum Arabic* consists of roundish transparent tears, colourless, or of a yellowish colour, shining fracture, without smell or taste, and almost perfectly soluble in water. The pieces which are most transparent, and have least colour, are reckoned the best. They are sometimes selected from the Gum Arabic in sorts, and sold for abont double the price, under the title of Picked gum. *Senegal* and *East Indian gum* are often indiscriminately sold under either name. The former, however, is generally found in round masses, larger than Gum Arabic, and the latter in stalactitical fragments. This kind is darker coloured than Gum Arabic, and is not so readily soluble in water. I have had gum from New South Wales, darker coloured even than East-India gum, and less soluble. There occurs also occasionally an insoluble gum, resembling Gum Senegal. It is at once known by putting a piece into the mouth. It does not adhere to the teeth, but swells and feels elastic under the teeth.

In the Parisian Pharmacopœia there are two varieties of Gum Arabic admitted; *Gummi Thuræi*, which, by comparison, I find to correspond with our picked, and *Gummi Jaddæ* with our common gum. Their *Gummi Senegalense* resembles our gum of the same name.

According to Hayne there are four kinds of gum in commerce: 1. *Gum Arabic*, in whitish round masses, full of fissures, very crumbly, which is said to exude as a frothy juice. 2. *Barbary gum*, in small, compact, commonly longish pieces, yellowish, or more or less brown, often almost transparent, and tolerably brittle. 3. *Gum Gedda*, larger, commonly round pieces, of a brownish red, and less brittle. These three kinds all come through the ports on the Mediterranean sea. 4. *Gum Senegal*, in large roundish pieces, of whitish, yellow, or reddish colour, very difficultly broken, and large conchoidal fracture.

The characters of gum, as a proximate vegetable principle, have been almost entirely derived from experiments on picked Gum Arabic; for although gum is generally said by chemists to be very widely diffused in the vegetable kingdom, and to be even produced by art, yet none of the products of analysis possess the characters of the good gums, which are natural concrete juices. Some chemists have also attempted to distinguish between gum and vegetable mucus; but they run into each other. Of both, without distinction, Fechner has enumerated 28 varieties.

Gum is colourless, or more or less tinged yellow or reddish brown, dry, brittle, with a conchoidal fracture, uncrystallizable; powder white, and permanent in the air. It is without smell, and has a weak, more or less insipid taste. It is soluble in water, cold and boiling, and in weak acids. It is insoluble in alcohol, ether, and the oils both volatile and fixed. It enters into some combinations with alkalies, earths and metallic oxides, some of them insoluble, so as to separate them from their solutions.

Mucilage does not readily become mouldy; but even the most concentrated solution of gum, after some time, is powerfully acid; and by drying fresh mucilage with heat, it also acquires a sour smell. Mucilage is affected by few reagents, but is precipitated by a solution of silicated potass, and converted into a jelly by one of permuriate of iron. Its reaction with borax is very singular. A saturated solution of each, on being mixed, becomes a firm jelly, which speedily dries into a glassy substance, so adhesive, as on drying to crush the glass in which it is left, and which becomes more fluid than the mucilage, by the addition of white sugar in powder. Gum is decomposed by the strong acids. By oxygenizement with nitric acid, it forms successively mucic, malic and oxalic acid; with oxymuriatic acid it forms citric acid. When exposed to heat, it does not melt, but softens, swells, gives out a sour smell, and becomes charred and incinerated. Its products are carbonic acid, and carburetted hydrogen gas, empyreumatic oil, and a considerable quantity of acetic acid, combined with a little ammonia.

Vauquelin found in 100 parts of Gum Arabic 97 of pure gum, and 3 of acetate, malate, and phosphate of lime, and oxide of iron; and Pleischl says he found traces of sulphur and ammonia. Dr Prout found fine Gum Arabic to consist of carbon 36.3, and water, 63.7. On being exposed for upwards of 20 hours to a temperature of 200° to 212°, it lost 12.4 parts, and now gave of carbon 44.4, and of water, 58.6, which very nearly agrees with the results of other chemists.

	Berzelius.	*Gmelin.*	*Thenard.*	*Berthollet.*	*Saussure.*	*Ure.*
Carbon,	41.906	41.94	42.23	43.90	45.84	35.13
Hydrogen,	6.788	6 45	6.93	6.86	5.46	0.08
Oxygen,	51.306	51.61	50.84	49.24	48.26	55.79
Azote,	a trace.	00.00	00.00	00.00	0.44	3.00

Medical use.—Gum is highly nutritious. During the whole time of the gum harvest, of the journey, and of the fair, the Moors of the Desert live almost entirely upon it; and experience has proved that six ounces are sufficient for the support of an adult during twenty-four hours. Dr R. Pearson has given a formula for gum cakes, consisting of made starch, powdered gum, catechu and citric acid, dried, to be carried by travellers, as a very condensed food. Gum possesses the powers of a mucilaginous demulcent in a high degree. It is useful, 1. In all cases where there seems a natural deficiency of mucus in the intestinal canal, and was therefore recommended by Degner, Pringle and others, dissolved in milk, barley water, or almond emulsion, to remove the tenesmus and painful stools. Zimmerman gave it in clyster for the same purpose. Some varieties of gum, however, seem to irritate the bowels, and to produce diarrhœa and tenesmus.

2. In cases of acrid poisons, or acrid substances in general, taken into the stomach, to envelop their particles, and mitigate their action. With the same view it is sometimes given along with acrid medicines.

3. In an irritable state of the respiratory passages, as catarrh, hoarseness, and cough. For this purpose it may be either used in substance as a troche, or in a strong solution as a linctus, and may be combined with a little opium.

4. In gonorrhœa and ardor urinæ, probably upon a false analogy.

5. In salivation after mercury, or in small pox to mitigate the burning from excoriation of the fauces.

6. In phthisis pulmonalis, both as supposed to check hæmorrhagy, and as a light nourishment.

Externally it is applied,

1. In powder, to bleeding vessels of a small size, as a styptic, operating by gluing them up.

2. In solution, injected into the urethra, in gonorrhœa.

Dose.—A scruple or upwards may be given three or four times a-day in substance, powder or solution, and it may be combined with syrups, infusions and decoctions in general. In tickling coughs, great advantage is derived from allowing a piece of convenient size to melt in the mouth. What are called jujube lozenges owe their virtue to the gum, of which they principally consist. Mr Ker of Paisley gave daily to the extent of eight ounces of Senegal gum, in the form of a thick mucilage; but the same quantity of Gum Arabic griped and purged.

Incompatibles.—Alcohol, sulphuric ether, solution of subacetate of lead, tincture of muriate of iron *.

Officinal preparations. Mucilago Acaciæ, *L.* M. A. Arabicæ, *E.* M. Gummi Arabici, *D.* Emulsio Arabica, *D.* Mistura cornu usti, *L.* Mistura Cretæ, *L.* Mist. Moschi, *L.* Confectio Amygdalarum, *L. D.* Pulvis Cretæ comp. *D. L.* Pulv. Tragacanthæ comp. *L.* Trochisci carb. calcis, *E.* Trochisci Glycyrr. glabræ, *E.* Troch. Glyc. glab. cum opio, *E.* †.

Sp. 138, Spr. ACACIA CATECHU. *Lond. Ed. Dub.*

Off.—Catechu. The extract of the wood.

ACACIÆ CATECHU EXTRACTUM *ex ligno.* *Ed. Dub.* CATECHU EXTRACTUM. *Lond.* ‡.

THIS tree is a native of Hindostan, growing in great abundance in the woods of Kankana, and seldom exceeding twelve or fourteen feet in height. In Bengal, the extract of catechu, which was formerly termed, with peculiar impropriety, Japan Earth, is principally prepared from the internal coloured part of the wood, by decoction, evaporation, and exsiccation in the sun. But catechu is also prepared in India from other species of Acacia, and even from the woods, barks, and fruits of other genera, as the Nauclea Gambir. In Mysore, it is chiefly prepared from the nuts of the Areca catechu. Many varieties of catechu have been sent to me from different parts of India.

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* In conformity with the practice of some other compilers, I have set down a few of the *chemical* incompatibles which are used in medicine; but the decompositions, and suspensions of decomposition, which so often occur in Galenical pharmacy, have as yet been very little studied by scientific chemists. The action of gum upon guaiac resin, its singular reaction with the borates, its effect in suspending various chemical decompositions, as of corrosive sublimate by lime water, &c. all require to be investigated and known by the scientific practitioner.

† I have preserved in this list only those compositions into which the Gum Arabic enters in substance, and have referred to mucilage those into which it enters in solution.

‡ *Syn.* Cachou, (*Fr.*) Katchu, (*Ger.*) Catecù, Catciu, Catto, (*Ital.*) Cutt, (*Can.* and *Hind.*) Var. *a.* Cuttacamboo, Var. *b.* Cashcuttie, (*Tam.*)

Catechu has the appearance of a dried extract of various forms, rounded masses, or cut into discs, squares or lozenges. It is perfectly opaque, and has always an earthy fracture. Its colour varies from pale brown to chocolate brown. Its taste is powerfully astringent, with a slight degree of bitter, and succeeded by a pleasant sweetness. It does not attract humidity from the air, and seems to keep without change for any length of time.

The Bombay catechu is of an uniform texture, and of a red-brown tint, its specific gravity being generally about 1.39. The extract from Bengal is more friable and less consistent. Its colour is like that of chocolate externally; but when broken its fracture presents streaks of chocolate and of red-brown. Its specific gravity is about 1.28.

In the first edition of this Dispensatory, in 1803, I published, as the results of my analysis of catechu, that it consisted chiefly of tannin and extractive. This has been confirmed by the subsequent examination by Sir H. Davy, who stated that it contains about one-half of its weight of tannin, 35 *per cent.* of extractive, 6 to 8 of mucilage, and 5 to 7 of impurities. Catechu is almost entirely soluble in large quantities of water, 18 ounces at 52° being required to 100 grains of extract, of which about 1-14th of earthy matter is left undissolved. The extractive is much less soluble than the astringent principle; and by the repeated application of small quantities of cold water, they may be nearly separated. The extractive is also more soluble in boiling than in cold water, and is deposited on cooling of a pale reddish-brown colour. It has more of the after-sweetness than entire catechu, and much less astringency. It gives a green colour to persulphate of iron. The strongest infusion of entire catechu has sp. gr. 1.057, and 1000 grains of it furnish 82 gr. of solid matter, of which 68 were astringent, and 14 extractive. Its colour is deep brown, taste highly astringent, no perceptible smell. It slightly reddens litmus paper. It gives dense fawn-coloured precipitates with concentrated sulphuric and muriatic acids; alkalies prevent its precipitation by gelatine. Solutions of lime, barytes, and strontia, give copious light brown precipitates. The carbonates of potash, soda, and of ammonia, produce only a slight turbidness. The salts of alumina, nitrate of potass, sulphate of magnesia, prussiate of potass, and many other neutral salts, cause precipitation. The nitrate or acetate of lead produces a dense light brown precipitate, also muriate of tin. It does not affect the protosulphate of iron, but with the persulphate gives a dense black precipitate. It precipitates solutions of albumen and gelatine, and tans skin.

Runge considers the principle of astringent substances, which is soluble in ether, alcohol and water, as an astringent salt or tannate. That obtained from catechu was crystallizable, and by repeated solution and crystallization was white. Its action upon reagents was generally negative. Dissolved in water, it did not precipitate solution of isinglass, potass, ammonia, lime, acetate of potass, of soda, of ammonia, of magnesia, of barytes, of zinc, or of copper. It gave a large white granular precipitate with acetate of lead, disappearing on the addition of alcohol; a considerable whitish yellow with protacetate of mercury, and produced with peracetate of iron a beautiful clear green passing into brown. The tincture caused a strong white coagulum with solution of potass; and after 12 hours, a yellowish precipitate, with acetate of lead and of zinc.

Berzelius also has examined what he considers as the tannin of catechu, got by precipitation with sulphuric acid and removal of the acid by carbonate of lead. Its taste is purely astringent, and in its reaction it resembles other species of tannin. It unites with acids, and requires a great excess of acid for its precipitation. It unites with bases, and forms a soluble salt with potass. It does not precipitate tartar emetic.

Med. use.—Catechu is consumed in enormous quantities, chiefly by the Malays, and other betle-eating nations. A small fragment, a little lime and some aromatics, rolled up in a part of the leaves of the *piper betel*, is almost constantly chewed as a luxury. This practice blackens the teeth. The pale catechu is preferred on account of its greater sweetness. The dark coloured is more astringent, and fitter for medical use. Catechu is one of the most convenient and powerful astringents we possess, and may be exhibited in every case where astringents are indicated. It is particularly serviceable in diarrhœa, in hoarseness from relaxation of the fauces, ulcers and aphthæ in the mouth, and in excoriations, with lymphatic exudation.

Dose.—In powder it may be given in doses of five or ten grains, combined with an equal quantity or more of gum powder, to render it less astringent to the taste. An extemporaneous decoction may be made in a few minutes of the same ingredients as the officinal infusion, and equally efficacious.

Incompatibles.—These will be understood by the preceding chemical history of the drug. I may add, that the officinal infusion is precipitated by laudanum, and yet they are very frequently mixed. The effect on the active principles of each remains to be ascertained.

Off. Prep.—Infusum Catechu comp. *L.* Inf. Acaciæ Cat. *E.* Tinctura Catechu, *L.* Tinct. Acaciæ Cat. *E.* Electuarium Catechu comp. *E. D.*

ACETUM; scientific synonime, ACIDUM ACETICUM IMPURUM. *Lond. Ed.* ACETUM VINI. *Dub.*

VINEGAR. Impure acetic acid [*].

VINEGAR, as obtained by the fermentation of vinous liquors, besides the pure acetic acid diluted with much water, contains tartaric acid, tartrate of potass, mucilaginous and saccharine matters, a peculiar spiritous liquor described by Mr Chenevix, and sometimes malic and phosphoric acids. Mr Chenevix found that English vinegar of specific gravity 1.0042 contained more water and mucilage, but less acid and spiritous liquor than French vinegar of 1.00721. The best vinegar is that prepared from white wine. Vinegar should be of a pale yellow colour, perfectly transparent, of a pleasant, somewhat pungent, acid state, but without any acrimony.

From the mucilaginous impurities which vinegar always contains, it is apt, on exposure to the air, to become turbid and ropy, and at last vapid. This inconvenience is best obviated by keeping it in bottles completely filled and well corked; and it is of advantage to boil it in the bottles a few minutes before they are corked, which should be done while it is still hot. Good French vinegar will keep in perfection many years, if the bottle be not frequently opened.

Vinegar is sometimes adulterated with sulphuric acid. Its presence is detected, if, on the addition of a solution of nitrate of baryta, a white precipitate is formed, which is insoluble in nitric acid. With the same intention, of making the vinegar appear stronger, different acrid vegetables are occasionally infused in it. This fraud is difficult of detection, except by ascertaining their power of neutralizing alkalies; but when tasted with attention, especially when previously diluted, the pungency of such vinegar will be found to depend rather on acrimony than acidity.

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[*] *Syn.* Vinaigre (*Fr.*) Essig, (*Germ.*) Aceto, (*Ital.*) Kadi, (*Tam.*) Cirka, (*Pers.* and *Dun.*) Kadidia, (*Cyng.*) Khull, (*Arab.*) Chooka, (*Malay.*) Poolla neelloo, (*Tel.*) Canchica, (*Sans.*) Tsoo, (*Chin.*)

Mr Phillips says that the strongest malt vinegar is termed *Proof Vinegar*, and by the manufacturer called No. 24. It is estimated to contain 5 *per cent.* real acid, and the maker is allowed to mix $\frac{1}{1000}$ of its weight of sulphuric acid with it. 1000 parts of such vinegar should saturate 148 of crystallized subcarbonate of soda, and ought not to yield more than 2.5 grains of sulphate of barytes.

Vinegar possesses strong antiseptic powers on dead animal and vegetable matters. Hence its employment in pickling. The fine green colour, so much admired in some vegetable pickles, is sometimes improperly given by means of copper. This poisonous addition is easily detected, by the fine blue colour produced, on dropping some carbonate of ammonia into the suspected liquor.

Med. use.—Its action on the living body is gently stimulant and astringent. It promotes transpiration and the discharge by urine; and used moderately as a condiment, it facilitates digestion; in excess it impairs it.

Vinegar is employed as a useful addition to drink in inflammatory fevers, in the proportion of about an ounce to a quart. Internally, it is used in ardent fevers and putrid diseases, in plague, in scurvy, in colica pictonum, and even in hydrophobia, and to counteract the effects of narcotic poisons and mephitic vapours. Faintings, hysterical and hypochondriacal complaints, and vomiting, are frequently relieved by vinegar taken into the stomach, or applied to the lips and nostrils. In the form of clyster, it is used in the same diseases, and in obstinate constipation. Externally, it is applied in fomentations and baths, as a stimulant and discutient, as a prophylactic against scarlatina, and as a remedy in all exanthematic diseases, mania, melancholia, apoplexy, headach, cynanche, dysentery; in fact, according to some, it is a panacea. More certainly it is useful in colliquative sweat, and in hæmorrhagies. It is likewise used in cataplasm against hepatic complaints; and its vapour is inhaled in putrid sore throat, croup and asthma, and diffused through the chambers of the sick, to correct the putrescency of the atmosphere.

Dose.—ʒi.–℥ſs diluted with water or barley water, with or without syrup, may be given internally, and ℥i.–℥ij. may be added to an emollient glyster. Lenvissa ordered no less than a pint three times a-day in hydrophobia.

Off. Prep.—Acidum aceticum dilutum, *L.* Ac. ac. tenue, *E.* Acetum distillatum, *D.* Syrupus aceti, *E.* Syr. colchici autumnalis, *E.* Cataplasma sinapis, *L. D.* Ceratum saponis, *L.* Linimentum æruginis, *L.*

ACIDUM ACETICUM FORTIUS. *Lond.* *.

"Stronger acetic acid distilled from wood. Its specific gravity is to that of water as 1.046 to 1000, and 100 grains of this acid should neutralize 87 of crystallized subcarbonate of soda." *L.*

One of the products of the destructive distillation of wood is acetic acid, at first very impure, from the empyreumatic oil with which it is largely contaminated. Copse oak, after being barked, is decomposed in iron cylinders, and the acid liquor is in the first place deprived of a great part of the oil or tar by distillation. It is still, however, very impure. The next step is to neutralize it with lime, and evaporate to dryness, so as to form an impure acetate of lime, from which a very strong acetic acid is obtained by adding sulphuric acid, and subjecting the mixture to distillation; the acetic acid passes over, and dry sulphate of lime is the residuum. The acetate of lime is sometimes first decomposed by sulphate of soda, when the products are sulphate of lime and acetate of soda. The latter is then decomposed by sulphuric acid, and the residuum in this case is sulphate of soda.

The acid thus obtained is called *pyrolignic acid*, although freed from empyreumatic oil, or *oak vinegar*. For culinary purposes it is very inferior to white wine vinegar, as it is totally destitute of fine aroma, and in its purest state is merely sour. For the chemical arts it is however superior, as it is totally free from all mucilage and decomposable matter; and it has the advantage of being easily got of the strength directed by the Pharmacopœia, which is six times as strong as common or distilled vinegar. Mr Phillips says he has not met with it of a greater strength than 1.043; but Messrs Turnbull and Ramsay of Glasgow furnish it abundantly of a strength which remains crystallized at 50° Fahr. When fluid at 60°, the specific gravity of this acid is 1.06296, and Dr Thomson considers it in this state to consist of one atom of real acid and one atom of water, as 7.375 grains of these crystals just neutralize 8.75 anhydrous carbonate of potass. The peculiar property of impure pyrolignic acid to preserve animal substances depends upon the empyreumatic oil, and was known to the Egyptians, who actually employed it in the preparation of mummies.

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* *Syn.* Oak vinegar, Pyrolignic acid, (*Eng.*) Acide pyrolignique, (*Fr.*) Brenzliche Holzsäure, (*Ger.*) Acido pyrolignico, (*Ital.*)

Med. use.—According to the report of a committee of physicians, who tried it in the hospital of Milan, in scrofula, scurvy, herpes, pellagra, dropsy, gangrene, cancer, and syphilitic ulcers, it was a safe but unnecessary remedy, as there were others more powerful. By other practitioners, it has been found useful in gangrene and sphacelus, scorbutic affections from abuse of mercury, in herpetic, flabby, sphacelating ulcers, in porrigo and carious teeth. It is a popular remedy in Salzburgh under the name of Tamarisc oil, and has been employed with advantage in rheumatic and putrid fevers, in scarlatina, and especially in dropsy. It is active in phagedenic chilblains, old ulcers, waterkanker, deafness, and chronic inflammation of the eyelids.

Dose.—Undiluted, this acid is used only externally as a rubefacient, blister, or escharotic. To prevent its evaporation, it must be applied with lint or cloth; or a piece of sticking plaster may have one surface wetted with it, and instantly applied. Its vapours may also be snuffed up the nostrils.

ACIDUM CITRICUM, crystalli. *Lond.* ACIDUM CITRICUM CRYSTALLIZATUM. *Ed.*

Citric acid in crystals *.

THE simple expressed juice of lemons is extremely apt to spoil, on account of the sugar, extractive, mucilage and water, which cause it to ferment.

Various means have been proposed and practised, with the intention of rendering it less perishable and less bulky. The juice has been evaporated to the consistence of a rob; but this always gives an empyreumatic taste, and does not separate the extractive or mucilage, so that it is still apt to ferment when agitated on board of ship in tropical climates. It has been exposed to frost, and part of the water removed under the form of ice; but this is liable to all the former objections, and, besides, where lemons grow, there is not a sufficient degree of cold. The addition of a quantity of alcohol to the inspissated juice separates the mucilage, but not the extractive or sugar. Scheele first pointed out the method of obtaining citric acid perfectly pure and crystallized †.

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* *Syn.* Acide citrique, (*Fr.*) Citronensäure, (*Ger.*) Acido citrico, (*It.*)

† In the London and Dublin Pharmacopœias a process is inserted for the preparation of citric acid, which will be found in the third part of this volume.

The crystals are permanent, and dissolve in three-fourths of their weight of cold, and half their weight of boiling water. The solution in eight waters is said to be equal in strength to lemon juice.

Med. use.—In some respects this concrete acid is superior, and in others greatly inferior to lemon juice. It has not the flavour, and, what is of more consequence, it has not the freshness or antiscorbutic powers of the fruit; but from its solid form and gradual solution it is convenient, and is excellently adapted for effervescing mixtures. Dr Haygarth found that 26 parts of the crystallized acid saturate 61 of subcarbonate of potash, 42 subcarbonate of ammonia, and 40 of carbonate of magnesia.

Dose.—Gr. x.–ʒſs daily, dissolved in water or any watery fluid, so as to acidify it pleasantly, and with the addition of a little syrup and a small bit of lemon peel, it makes an excellent lemonade.

Incompatibles.—It is neutralized by all bases, and is precipitated by salts of lime and of lead.

ACIDUM SULPHURICUM. *Lond. Ed.* ACIDUM SULPHURICUM VENALE. *Dub.*

Commercial sulphuric acid, Vitriolic acid, Oil of vitriol [*].

THE London and Dublin Colleges direct, that its specific gravity should be to that of water as 1850 to 1000; the Edinburgh College as 1845 to 1000.

It is inserted among the materia medica, because it is never prepared by the apothecary, but purchased from wholesale manufacturers. It is obtained in two ways; the first, by distilling off the acid from sulphate of iron, previously deprived of its water of crystallization by heat. In this way the strongest acid is obtained at once, but it is apt to contain iron or copper, besides sulphurous acid. The second process is by burning sulphur, and transmitting its fumes into immense leaden chambers, of which the bottom is covered with water. Along with the sulphurous acid gas, it is necessary that a proportion of nitrous acid gas should be mixed. These two acid gases by their union form minute white crystals, which I find to be of considerable permanence if kept dry, but which are decomposed the moment they touch water, with an evolution of red fumes. The sulphurous acid is converted into sulphuric by abstracting a proportion of oxygen from the nitrous, which immediately ascends in the form of nitric oxide, and uniting with the oxygen of the air of the chamber is again converted into nitrous acid, which combines with more sulphurous acid, and thus the same quantity of nitrous acid oxygenates successively many doses of sulphurous acid, until the air of the chamber be deprived of its oxygen. The dilute sulphuric acid thus obtained is then concentrated by evaporation, first in leaden troughs, and then in glass boilers. Got in this way it generally contains lead, which is easily detected by mixing a portion of the acid with three parts of distilled water; and if the acid be impure, a deposition will be formed. It may be rendered perfectly pure by distillation from a green glass or platinum retort, gradually heated in a sand-bath, as long as any acid comes over. The receiver should not be luted on.

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[*] *Syn.* Acide sulphurique, (*Fr.*) Schefelsäure, (*Ger.*) Acido solforico, (*It.*)

All the sulphuric acid used in Britain is prepared in the latter mode, and is known on the Continent by the name of English sulphuric acid, to distinguish it from the fuming acid of Nordhausen, prepared by the first process. It is an error in the London and Dublin Colleges, to direct that the acid should have the sp. gr. of 1.850, as Dr Ure found that it could not be prepared stronger than 1.8455, and that the sp. gr. of commercial acid should not exceed 1.8485, which already contains from $\frac{5}{1000}$ to $\frac{7\cdot5}{1000}$ of foreign saline matter, chiefly sulphate of potass and of lead, but that of the shops often contains 3 to 4 *per cent.*, above which it should be considered as sophisticated.

The common state of sulphuric acid is that of a dense liquid containing water; specific gravity 1.847; slightly viscid; transparent and colourless; without smell; of a strong acid taste. It freezes at —36°, and boils somewhat above 600°. It has a strong attraction for water, absorbing it rapidly from the atmosphere, and producing considerable heat when mixed with it. It is decomposed by most inflammable substances yielding sulphurous acid, and getting blackened from their charcoal. It does not oxidize gold, platinum, tungsten, or titanium. It decomposes the alkaline and earthy sulphurets, and chars organic substances. It consists of 1 atom of anhydrous sulphuric acid, and 1 atom of water, or of 50 and 11.25 by weight. M. Bussy has lately succeeded in preparing anhydrous sulphuric acid, which consists of 1 atom of sulphur and 3 of oxygen, or by weight 20 and 30 parts. It is solid, opaque, white; difficultly scissile, or in groups of silky crystals; fuming at ordinary temperatures; strongly attracting humidity from the air; hissing when thrown upon water, generating steam; combining with anhydrous bases, without the evolution of any sulphurous acid; charring vegetable substances instantly. It melts at 77° Fahr., becoming more liquid than sulphuric acid, strongly refracting light; sp. gr. 1.97; dissolving sulphur brown, green or blue; iodine greenish blue; and indigo red.

The glacial sulphuric acid of Nordhausen is a variable mixture of the anhydrous acid, common liquid acid, and sometimes sulphurous acid.

Sulphuric acid acts powerfully on dead animal substances, becoming diluted with water formed by the union of part of their hydrogen and oxygen; another portion of the hydrogen combines with the azote to form ammonia, and the carbon is separated in the state of charcoal. The affinities which regulate this action are so powerful, that it produces the same effects on the living solid, and therefore it acts upon them as a corrosive.

Med. use.—Internally sulphuric acid is never given undiluted. Externally it is occasionally used as a caustic, but it has the great disadvantage of attracting the moisture from the air, and spreading further than is intended. This may be prevented, by defending the neighbouring parts with several layers of adhesive plaster spread on leather. Its activity is also diminished by mixture with greasy substances. The officinal ointment in the Dublin pharmacopœia is made with one part of acid to eight of lard. It is applied in swellings of the knee-joint, especially those depending on thickened cellular tissue. Dr Duncan senior found an ointment of half this strength successful in scabies; but the part must be covered with linen, as flannel is corroded by it. A still weaker liniment of two ounces of olive oil, one ounce of oil of turpentine, and forty-five drops of sulphuric acid, is rubbed on in chronic pains of the joints, and the sequelæ of bruises and sprains, and in rheumatic and gouty pains. Charpie corroded with sulphuric acid is applied with benefit in gangrene. Some drops are applied as a preventive to the wounds made by the teeth of a dog suspected to be mad.

Incompatibles.—All the alkalies, earths, metallic oxides, and their carbonates, which neutralize the acid; almost all salts, which it decomposes; alcohol, which it etherifies; all organic substances, which it decomposes or chars, being itself converted into sulphurous acid; all astringent infusions, which it precipitates; and many other vegetable preparations, upon which its action has not been sufficiently studied.

Off. Prep.—Acidum sulphuricum purum, *D.* Acid. sulph. dilutum, *L. E.* Acid. sulph. aromaticum, *E.* Potassæ sulphas, *L. D.* Pot. supersulphas, *L.* Pot. bisulphas, *D.*

Sodæ sulphas, *L. E. D.* Magnesiæ sulphas purum, *D.* Ferri sulphas, *L. E. D.* Zinci sulphas, *L. E.* Solutio sulphatis cupri, *E.* Subsulphas hydrargyri flavus, *E.* Unguentum acidi sulphurici. *D.*

Ammoniæ hydrosulphuretum, *D.* Aqua supercarbonatis potassæ, *E.* Aqua supercarb. sodæ, *E.* Sodæ phosphas, *E.* Acidum aceticum, *D.* Acid. muriaticum, *L. E. D.* Acid. nitricum, *L. E. D.* Aqua chlorinii, *D.* Acid. citricum, *L.* Acid. tartaricum, *L. D.* Acid. benzoicum, *E.* Antimonii sulphuretum præcipitatum, *L.* Hydrargyri oxymurias, *L.* Hydrarg. murias corrosivum, *E.* Hydrarg. submurias, *L.* Æther sulphuricus, *L. E.* Liquor æthereus sulphuricus, *D.* Æther nitrosus, *D.* *.

ACONITUM.

Willd. *g.* 1062, Spr. 1986. *Polyandria Trigynia.*—Nat. ord. *Multisiliquæ* of Linn., *Ranunculaceæ* of Jussieu.

Species 27. Spr. ACONITUM PANICULATUM. *De Candolle. Dub.*

Sp. 33. Spr. ACONITUM NAPELLUS. *Lond. Ed.*

Large blue Wolfsbane, Monk's hood, Aconite †.

Officinal.—The leaves.

FOLIA. *Lond. Dub.* ACONITI NAPELLI FOLIA. *Ed.*

DE Candolle, in his *Prodromus*, has divided the genus *Aconitum* into four sections; *Anthora, Lycoctonum, Cammarum,* and *Napellus.* The plant which Störck used in medicine, and whose effects he has described, was a variety of a species of the third order, or *Cammarum*, to which Lamarck and De Candolle have given the trivial name of *paniculatum,* var. γ. *Störckianum.* This is accordingly now set down as the officinal species in the Pharmacopœia of Dublin.

It is a perennial plant, found in the Alpine forests of Carinthia, Carniola, and other mountainous countries in Germany, and not yet, I believe, cultivated in our gardens. I have now, however, brought the seeds from the botanic garden of Geneva, so that we may soon use the genuine species.

The fresh plant and root are very violent poisons, producing remarkable debility, paralysis of the limbs, convulsive motions of the face, bilious vomiting, and catharsis, vertigo, delirium, asphyxia, death. The fresh leaves have very little smell, but when chewed have an acrid taste, and excite lancinating pains, and swelling of the tongue. The plant, in a state of inflorescence, bruised in a mortar, does not give out the same pungent smell as the other acrid *Ranunculaceæ.* When distilled with water in a gentle heat, it yields a product with an herbaceous, insipid, and not at all acrid taste, and leaves a residuum which also is not acrid. Still the activity of its extract is not to be denied.

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* Only those preparations are enumerated in which the strong commercial acid is used in the Pharmacopœia quoted. The purified or diluted acid is used in corresponding preparations to some of these by the other Colleges, and is noted in its proper place.

† *Syn.* Le napel bleu, l'aconit à navet, (*Fr.*) Der blaue Sturmhut; die Mönchskappe, (*Ger.*) Napello, (*It.*) Ακονιτον, (*Diosc.*)

Peschier of Geneva examined, by Sertürner's process, both the *Aconitum Napellus* and *A. paniculatum.* He thought he had found them to contain a peculiar acid and alkali; but his analysis has not been confirmed. Dr R. Brandes, in the introduction to his very elaborate paper on *Atropa Belladonna,* merely enumerates aconite among the vegetables which contain a poisonous base; and in a subsequent paper, he distinctly states that he has discovered the narcotic principles of aconite, and of all other narcotic plants, but is obliged to postpone the publication of his investigation on account of his injured health. Geiger, in a historical review of the organic bases, enumerates aconitine as discovered by Brandes in the *Aconitum Neomontanum,* but merely adds that it is an acrid and poisonous alkali, whose further properties are still to be made known. Lastly, Chevallier, in the very valuable work in which he is engaged along with Richard, also states, that he is unacquainted with the details of Brandes's investigation of aconite, and gives an account of Dr Pallas's analysis of the root of the *A. Lycoctonum.*

By drying, the acrimony of the leaves is said to be almost entirely destroyed. For medical use, they must be gathered before the stem shoots.

Uses and dose.—When properly administered, it acts chiefly on the sensibility, producing at last headach and vertigo, with anorexia, but no increased disposition to sleep, or any effect on the pulse or secretions.

On many occasions it has been found a very effectual remedy in glandular swellings, venereal nodes, stiff joints, spina ventosa, itch, amaurosis, gouty and rheumatic pains, intermittent fevers, and convulsive disorders.

When the powder of the dried leaves is to be used, we may begin by giving one or two grains, and gradually increase the dose; but it is commonly used in the form of an inspissated juice. As soon as the plant is gathered, the juice is expressed and evaporated, without any previous clarification, to the consistence of an extract. It is to be regretted, that the powers of this inspissated juice vary very much; its action is often very violent, and it is often totally inert. It may therefore be laid down as an universal rule, in the employment of this and of many other similar active medicines, to begin with very small doses, and to increase them gradually to the necessary degree; and whenever we have occasion to begin a new parcel of the medicine, we should again commence with the smallest dose, and proceed with the same caution as at first.

We may begin with giving half a grain of the extract, either formed into a powder with ten grains of white sugar, or made up with any convenient addition into a pill, twice or thrice a-day, and gradually increase the dose. I have used the extract prepared *in vacuo*, by my friend M. Barry, with decided, though not always permanent success, in cases of sciatica; and its effect in suspending the pain was always accompanied by a tingling sensation in the affected part, sometimes increasing to such a degree, as to render the intermission of the remedy necessary. The pain would then return, but in a mitigated degree; and thus, at last, by the repeated exhibition and omission of the aconite, the disease was sometimes finally removed. From the use of from 3 to 5 grains of the extract, taken daily for three or four days, the specific effects were generally produced. A tincture of aconite may be prepared, by digesting one part of the dried leaves in six parts of the spirit of wine; the dose of which will be at first five or ten drops, and may be gradually increased to forty.

Off. Prep.—Extractum aconiti, *L.* Succus spissatus aconiti, *D.* Suc. spiss. A. Napelli, *E.*

ACORUS CALAMUS. *Ed. Lond.*

Willd. *g.* 663; Spr. 1293. *sp.* 1; Smith, *Flor. Brit. g.* 179. *sp.* 1.—*Hexandria Monogynia.*—Nat. ord. *Piperitæ*, Lin., *Aroideæ* of Jussieu.

Sweet flag [*].

Officinal.—The root.

ACORI CALAMI RADIX. *Ed.* CALAMI RADIX. *Lond.*

THIS plant is perennial, and grows plentifully in rivulets and marshy places about Norwich, and other parts of England. The shops have been usually supplied from the Levant with dried roots, which do not appear to be superior to those of our own growth.

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[*] *Syn.* Of the European species Acorus vrai, Acorus odorant, (*Fr.*) Kalmuswurzel, Ackerwurzel, (*Ger.*) Acoro, Calamo odorato, (*It.*) Of the Asiatic species, Vasoamboo, (*Tam.*) Butch, (*Duk.*) Vudge, (*Pers.*) Bach, (*Hind.*), Vācha, Haimāvatī, Golomi, (*Sans.*) Vudza, (*Tel.*) Wadda kaha, Vaesambu, (*Cyng.*) Bagy, (*Can.*) Vaynboo, (*Malealiē.*) Ακορος, (*Diosc.*)

The root is full of joints, crooked, somewhat flatted on the sides, internally of a white colour, and loose spongy texture; its smell is strong; the taste warm, acrid, bitterish, and aromatic; both the smell and taste are improved by exsiccation. It is generally looked upon as a carminative and stomachic medicine, and as such is sometimes made use of in practice. The fresh root candied is said to be employed at Constantinople as a preservative against epidemic diseases. The leaves of this plant have a sweet fragrant smell, more agreeable, though weaker, than that of the roots.

From sixteen ounces of the dried root, Neumann obtained by distillation about two scruples of fragrant volatile oil. It also rose in distillation with water, but not with alcohol. It contains also extractive, gum, resin, and inuline, according to Trommsdorf's analysis.

French pharmacologists caution us not to confound this with the *Calamus aromaticus*, nor with the *Acorus verus.* The latter is a distinct species of the same genus, growing in India, the *A. terrestris* of Rumphius and Sprengel, sp. 3.; but it is not ascertained what plant was designed by the ancients under the name of Calamus aromaticus. For some observations on this subject, I must refer to the Supplement to this Dispensatory, which I published in 1829.

Med. use.—It may be given in doses of ℈i. to ℈ij. in powder as a stomachic, or of ʒi. in infusion; but it is scarcely used.

ADEPS OVILLUS. *Ed.* Ex ove ariete. *Dub.* SEVUM. *Lond.* *Off.*—Mutton suet *.

MUTTON-SUET is officinal, for the purpose of giving consistency to some ointments and plasters. It is chiefly the kidney fat of the wedder which is used. It is prepared by slicing the suet, and melting out the fat, by boiling it in a little water. It should be white, firm, almost without smell, and of a bland taste. It should dissolve in forty-four parts of boiling alcohol, from which it separates on cooling. It melts at 103° Fahr. It contains a large proportion of stearine. It should be kept in a cool dry place, and not in metallic vessels. If good suet be not at hand, it may be extracted from mutton kidney fat extemporaneously.

Off. Prep.—Adeps ovillus præparatus, *D.* Sevum præparatum, *L.*

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* *Syn.* Suif, Graisse de mouton, (*Fr.*) Schaafsunschlitt, (*Ger.*) Sego di cepora, Grasso di castrato, (*It.*) Aatoo kólupoo, (*Tam.*) Vaynta-koroo, (*Tel.*) Lemāk, (*Mal.*) Buckrékechirbie, (*Duk.*) Elloo muss tail, (*Cyng.*) Addja vuppa, (*Sans.*).

ADEPS SUILLUS. *Ed.* Ex sue scrofa. *Dub.* ADEPS. *Lond. Off.*—Hogs-lard. Axunge[*].

ANIMAL fats possess many properties in common with the fixed oils, and differ chiefly in their being congealed and opaque at the temperature of the atmosphere. Fats vary considerably in fluidity, from the semifluid duck's grease to the solid mutton suet. All these fats, as well as the fixed oils, have been lately ascertained by M. Chevreul and Braconnot to consist of two substances, Stearine and Elaine, combined in different proportions, and separable from each other by merely compressing the fat in bibulous paper. One part is absorbed by the paper, and makes a greasy stain, while the remaining part becomes hard and friable. *Stearine* is crystallizable, white and brittle, with little smell or taste. It melts at from 109° to 120°, is soluble in hot alcohol, but crystallizes from it on cooling. It is altered by the action of alkalies, and forms with them soap. It is the solid part of suet and fats. *Elaine* is the fluid constituent of oil and fat, remaining liquid at 59°, and soluble in cold alcohol, which thus furnishes another means of separating them. It is seldom pure, or free from colour and taste.

Hogs-lard is the fat of the omentum and mesentery of the pig. When taken from the animal it has a white, pinkish colour, its smell is vapid, its consistence soft, and it greases the fingers. In this state it is mixed with membranes, and contains a certain quantity of blood, which must be removed to render it fit for use. The membranes covering the fat are to be taken off as much as possible. It is then to be kneaded in successive portions of water, or beat in a mortar with water. After it ceases to give out any thing to water, it is put into a copper vessel, and heated very gently, or by a vapour bath. When the grease is melted, it is run through linen, which retains most of the membranes, and is allowed to cool. On becoming cold, it is cut into horizontal slices, to separate the bottom, which contains any impurities. The pure portion is again put over the fire, to separate the small quantity of water which still remains. This is known by the transparency of the liquid fat; and when a little is thrown into the fire, it does not crackle. It is now taken off the fire, and poured, when it is half cold, into the bladders or pots in which it is to be kept.

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[*] *Syn.*—Axong de porc, Graisse, Saindoux, (*Fr.*) Schweinschmalz, (*Ger.*) Sugna di majale, (*It.*) Poonnie cólúpoo, (*Tam.*) Kundie karro, (*Tel.*) Sūkarvapā, (*Sans.*) Oorumusstoo latail, (*Cyng.*)

Lard should be white, pultaceous, sub-diaphonous in thin layers, somewhat tough, without smell, of a sweetish fat taste, and melting at 100° F. If it is not to be had of this quality, it may be prepared extemporaneously. It is to be kept in a cool dry place, in vessels with a cover, luted on with linen smeared with white of egg and powdered lime. Notwithstanding every precaution, lard at length becomes rancid, and unfit for many purposes. Thus, when fresh, it makes with hydriodate of potass a pure white ointment; when rancid, the ointment is more or less deep yellow. Rancid lard is said to kill mercury more quickly than fresh lard.

Lard consists of elaine 62 parts, and of stearine 38. According to Saussure and Berard, its composition is

	Carbon.	*Oxygen.*	*Hydrogen.*	*Azote.*
S.	78.843	8.502	12.182	0.473
B.	69.000	9.660	21.340	0.000

Med. use.—Hogs-lard is emollient, and is a convenient article for the formation of ointments, plasters, and liniments. It is also used, without addition, to discuss tumours by friction.

Off. prep.—Adeps præparata, *L.* Adeps suillus præparatus, *D.* Unguentum resinosum, *E.**. U. infusi cantharidis vesicatoriæ, *E.* Ceratum juniperis sabinæ, *E.* U. Gallæ, *E.* U. acidi nitrosi, *E.* U. hydrargyri, *E.* U. oxidi hydrarg. cinerei, *E.* U. oxid. hydrarg. rubri, *E.* U. nitratis hydrarg. fortius, *E.* U. nitr. hyd. mitius, *E.* U. sulphuris, *E.* Emplastrum simplex, *E.*

ALCOHOL FORTIUS. *Ed.* SPIRITUS RECTIFICATUS. *Lond. Dub.*

Alcohol, rectified spirit of wine.

THE specific gravity should be, according to the London and Edinburgh colleges, to that of water, as 835 to 1000. The Dublin college order it of the specific gravity 840 at 60°, or 844 at 52°.

Alcohol is the characteristic principle of vinous liquors. It is formed from the decomposition of sugar by fermentation, and is found in greatest quantity in the wines of warm countries, prepared from thoroughly ripened grapes. In our home-made wines, sugar is added to compensate for the want of it in our acescent fruits, and some of them, according to

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* According to the London and Dublin Colleges, their preparations are made with purified fat. The Edinburgh College is satisfied with the lard and suet as found in commerce.

Brande's experiments, yield more alcohol than any foreign wine. It is the proportion of alcohol which renders wines more or less generous, and prevents them from becoming sour. The richer a wine is in alcohol, the less malic acid it contains; and therefore the best wines give the best brandy, because they are free from the disagreeable taste which the malic acid imparts to it. Old wines give better brandy than new wines, but less of it.

Alcohol is separated from vinous liquors by distillation. The spiritous liquor obtained by the first distillation is very much diluted, and is called *Low wines.* These are redistilled or rectified to render them stronger. But even rectified spirit of wine contains much water, to free it from which the aid of chemical agents is necessary.

In this country, alcohol is procured from an infusion of malt, and before its rectification is termed Whisky. In the East Indies, arrack, a spiritous liquor, is distilled from rice; in the West Indies, rum from the sugar-cane; and in France and Spain, brandy from wine. Of these, the French brandy is the finest spirit; for the others are more or less impregnated with unpleasant essential oils, of which it is almost impossible to free them entirely.

Many proposals have been made to deprive spirits of the unpleasant flavour, arising either from being still-burnt, or impregnated with volatile oil, acquired from the material from which they are prepared. The empyreuma disappears spontaneously after a time. To destroy the other unpleasant flavours, it is sometimes sufficient to mix them with a fourth part of their weight of charcoal for 48 hours, and then to draw them off by distillation. When this does not succeed, Prof. Oersted has recommended the addition of an ounce of any chloruret to 10 litres of spirits; but M. Chevallier thinks that chlorine itself would be preferable. The addition of a chloruret has been proposed also to destroy the animal matters contained in spirits, which have been used for anatomical preparations, that they may serve again. The same end would probably be more easily attained by the addition of a little corrosive sublimate, and of charcoal, before redistilling them.

Dealers judge of the strength of spirits by the size and durability of the bubbles they form, when poured from one vessel into another, or on agitating them in a vessel partly filled. Another proof is, by putting some gunpowder in a spoon, and then covering it with the spirit to be tried, which is set on fire; if the gunpowder be kindled, the spirit is supposed to be strong, and *vice versa.* But a small quantity of spirits will always kindle gunpowder, and a large quantity never. Another proof is by the carbonate of potass, which attracts the water, and dissolves in it, while the alcohol swims above, and the strength of the spirits is judged of by its quantity. But all these are uncertain; and dependence can only be put in the proof by hydrometers, or some other contrivance for ascertaining the weight of a given bulk at a given temperature. In the Elements of Pharmacy, p. 27, and in the tables subjoined in the Appendix, p. 142, some account is given of the various attempts at establishing an alcoholimeter, which should indicate the *percents.* of absolute alcohol contained in spirits of less strength. These, as calculated by different experimentalists, differ much from each other, and must differ until they agree as to the sp. gr. of absolute alcohol. Mr Gilpin and Sir C. Blagden, whose authority is followed in this country, assume it at 825, whereas most of the foreign authors rate it as high as 792. I regret that I have not seen the work of Gay-Lussac on the subject. Very elaborate tables were published at Jena, in 1826, by Dr Körner, who was employed by the Prussian government. It may not be superfluous to give here the terms used in France to designate various strengths of spirits, as they are constantly met with in reading foreign books. Alcohol is said to be at 40°, alcohol at 36°, when it marks these degrees on the Areometer or *Pese-alcohol.* Alcohol, which is only 33° on that instrument, is called *trois-six* *. When it is more diluted with water, and is only 22° or 23°, it is called Oil proof, *(Preuve d'huile)*; and Dutch proof, *(Preuve d'Hollande)*, when it is only 20°.

Off. Prep.—Alcohol, *L. D.* Alcohol ammoniatum, *E.* Spiritus ammoniæ, *D.* Spir. amm. aromaticus, *L.* Spt. am. succinatus, *L.* Spt. cinnamomi, *L.* Spt. lavandulæ, *L.* Spt. lavand. spicæ, *E.* Spt. menthæ piperitæ, *L. D.* Spt. menthæ viridis, *L. D.* Spt. pulegii, *L.* Spt. rosmarini, *L.* Spt. rorismarini officinalis, *E.* Tinctura aloes, *L.* T. aloes soccotorinæ, *E.* T. aloes et myrrhæ, *E.* T. assæfœtidæ, *L. D.* T. ferulæ assaf., *E.* T. balsami tolutani, *D.* T. toluiferæ balsami, *E.* Tinctura benzoini comp., *L. E. D.* T. camphoræ, *E. D.* Spiritus camphoræ, *L.* T. castorei, *L. E.* T. guaiaci, *L. D.* T. guaiac. officinalis, *E.* T. kino, *L.* T. moschi, *D.* T. myrrhæ, *L. E. D.*

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* "It is so called, because, when mixed with about its weight of water, it forms common eau-de-vie, of which six parts thus contain three of such spirit."

T. nucis vomicæ, *D.* T. zingiberis, *L. D.* T. saponis camphorata, *E.* T. saponis et opii, *E.* T. iodinii, *D.* Acidum sulphuricum aromaticum, *E. D.* Liquor tartari emetici, *D.* Vinum antimonii tartarizati, *L.* Liquor muriatis ferri, *D.* Tinctura ferri muriatis, *L. E.* T. acetatis ferri, *D.* T. acetatis zinci, *D.* Liquor hydrargyri oxymuriatis, *L.* Acetum scillæ, *D.* Acidum aceticum scilliticum, *L.* Decoctum veratri, *L. D.* Æther sulphuricus, *L. E.* Liquor æthereus sulphuricus, *D.* Spt. ætheris sulphurici, *L.* Æther sulph. cum alcohole, *E.* Æther nitrosus, *D.* Spt. ætheris nitrosi, *D. E. L.* Styracis balsamum purificatum, *L.* Extractum cinchonæ resinosum, *L.* Ext. cinchon. lancifoliæ, *E.* Ext. jalapæ, *L. D.* Ext. convolvuli jal., *E.* Ext. sarsaparillæ fluidum, *D.* Quininæ sulphas, *D.* Potassæ hydriodas, *D.*

ALCOHOL DILUTIUS. *Ed.* SPIRITUS VINOSUS TENUIOR. *Dub.* SPIRITUS TENUIOR. *Lond.*

Diluted Alcohol. Spirit of wine. Proof spirit.

WEAKER ALCOHOL is by the Edinburgh College directed to be prepared by mixing the rectified spirit of 835 with an equal bulk of water, and the specific gravity of the mixture is to that of distilled water as 935 to 1000, (*Ed.*) The London College orders it to have the specific gravity of 930, the Dublin 919 at 60°, or 923 at 51°; and adds, "Almost all the spirit sold under the name of *Proof spirit* is contaminated with empyreumatic oil, and unfit for medical use. A spirit of nearly the same specific gravity is prepared by mixing $5\frac{1}{4}$ measures of rectified spirit with three measures of distilled water at 60°."

Diluted alcohol, for internal use, should always be prepared, by mixing rectified spirit with water; but it is hardly to be expected, that apothecaries will either be at the trouble or expense of preparing it in this manner. Instead of it, a commercial spirit of the requisite strength is commonly employed. The strength of the diluted alcohol of each of the colleges is different; that of Dublin being equal to Government proof spirit, that of London 9 under proof, and that of Edinburgh so low as 14 under proof. This difference considerably affects the strength and cost of the tinctures, and is much to be regretted.

In the former editions a tabular view was given of the expressions employed in Clarke's hydrometer for spirits of various degrees of strength; but as the instrument of Dicas and Sykes is now used by the excise, the following table is substituted.

Comparative Table of Specific Gravities of Spirits, with the degrees of Dicas and Sykes's Hydrometer; and the proportion of alcohol of 825, which they are estimated to contain; at 60° [1].

Sp. Gr.	Parts of such alcohol in 1000.	Over Proof D. & S.	Sp. Gr.	Parts of such alcohol in 1000.	Over Proof D. & S.	Sp. Gr.	Parts of such alcohol in 1000.	Spirits under Proof.
825	1000	63 [2]	884	729	28	938	456	17 [13]
826	993	62	886	719	27	940	444	19
828	984	61	888	709	25	942	432	21 [14]
830	975	60	890	699	24	944	421	23
832	966	59	892	689	22	946	411	24 [15]
834	957	58 [3]	894	680	20	948	397	26
836	949	57	896	671	19	950	382	28
838	940	56	898	662	17	952	370	31
840	932	55 [4]	900	649	15	954	358	34 [16]
842	924	54	902	641	14	956	346	36
844	916	53	904	631	12	958	333	39
846	908	52	906	621	11	960	315	42
848	898	50	908	612	10	962	300	45
850	888	49	910	602	8 [5]	964	285	48 [17]
852	878	48	912	591	7	966	270	51
854	868	47	914	581	5	968	253	54
856	857	46	916	571	3	970	236	57
858	849	45	918	562	1	972	218	60
860	840	45	920	550	0 [6]	974	200	64
862	833	44			Spirits under proof.	978	175	72
864	823	43				980	150	75
866	813	42				982	135	77
868	807	40	922	540	2	984	120	80
870	798	39	924	531	4	986	105	82
872	787	38	926	521	6 [7]	988	90	85
874	776	36	928	510	7 [8]	990	75	89
876	768	34	930	500	9 [9]	992	60	92
878	757	32	932	489	11 [10]	994	45	95
880	746	30	934	479	13 [11]	996	30	96
882	738	29	936	468	15 [12]	998	15	98
						1000	Distilled water.	

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[1] Tables. &c. By James Dallas, 8vo. London, 1818.

[2] 810 *Alcohol*, Dub.; 815 *Alcohol*, Lond.

[3] 835 *Spiritus Rect.*, Lond.; *Alcohol fortius*, Ed.

[4] *Spiritus Rectificatus*, Dub.

[5] One to ten over hydrometer proof.

[6] Proof by the excise law; 919 *Spiritus tenuior*, Dub.

[7] One in 20, Clarke's hydrometer.

[8] One in 15.

[9] Equal parts of alcohol and water. *Spiritus tenuior*, Lond.

[10] One in 10.

[11] —— 2— 935 *Alcohol dilutius*, Edin.

[12] One in 7.

[13] —— 6.

[14] —— 5.

[15] One in 4.

[16] —— 3.

[17] —— 2.

Medical uses.—On the living body alcohol acts as a most powerful diffusible intoxicating stimulus. It coagulates all the albuminous and gelatinous fluids, and corrugates all the solids. Applied externally, it contracts the caliber of the vessels, and thus may restrain passive hæmorrhagies. It instantly contracts the extremities of the nerves it touches, and deprives them of sense; by this means easing them of pain, but at the same time destroying their use. Alcohol taken undiluted into the stomach produces the same effects, contracting all the solid parts which it touches, and destroying, at least for a time, their use and office; if the quantity be considerable, a palsy or apoplexy follows, which ends in death. Taken in small quantity, and diluted, it acts as a cordial and tonic, raises the pulse, stimulates the stomach, and promotes digestion; if drunk to excess, the senses get disordered, intoxication follows, voluntary motion is destroyed, and at length death itself ensues. The remedies to be prescribed in this species of poisoning are emetics, either oil alone, or oil mixed with ether, which are often employed by the vulgar, or some drops of *aqua ammoniæ*, or what is safer, a drachm of *aqua acetatis ammoniæ* in a glass of water. Its habitual use produces the most lamentable consequences,—dyspepsia, hypochondriasis, visceral obstructions, dropsy, tremors and paralysis. In its effects upon the system, alcohol, when diluted, agrees so nearly with wine, that it is sufficient to refer to that article. Sometimes, however, it is given undiluted, (rectified spirit,) in extreme cases, as an excitant in syncope or asphyxia, and in arthritic cramp of the stomach, and to determine the contraction of the uterus in alarming flooding. Externally, it may be applied to produce cold by its evaporation, or to stimulate by its pungency; and in surgical practice it is often applied to bruises, indolent tumours, gangrene, and it forms a chief ingredient of the evaporating lotions.

Off. Prep.—Tinctura aloes, *D.* T. aurantii, *L.* T. angusturæ, *D.* T. Bonplandiæ trifoliatæ, *E.* T. amomi repentis, *E.* T. cardamomi comp. *D.* T. am. zingiberis, *E.* T. buchu, *D.* T. cantharidis, *D.* T. canth. vesicatoriæ, *L.* T. capsici, *D.* T. cascarillæ, *D. L.* T. crotonis eleutheriæ, *E.* T. catechu, *L. D.* T. acaciæ cat. *E.* T. castorei rossici, *D.* T. cinchonæ, *L. D.* T. cinch. lancifoliæ, *E.* T. cinchon. comp. *L. E. D.* T. cinnamomi, *L. D.* T. lauri cinn. *E.* T. cinnam. comp. *L. E.* T. seminum colchici, *D.* T. colombæ, *E. D.* T. conii, *D.* T. conii maculati, *E.* T. croci sativi, *E.* T. digitalis, *D. L.* T. digit. purpureæ, *E.* T. galbani, *D.* T. gallarum, *D. E.* T. gentianæ comp.

L. E. D. T. hellebori nigri, *L. E. D.* T. humuli, *L. D.* T. humuli lupuli, *E.* T. hyosciami, *L. D.* T. hyosc. nigri, *E.* T. jalapæ, *L. D.* T. convolvuli jalap. *E.* T. kino, *E. D.* T. myrrhæ, *D.* T. opii, *L. E. D.* T. opii camphorata, *D. E.* T. piperis cubebæ, *D.* T. quassiæ, *D.* T. quassiæ excelsæ, *E.* T. rhei, *L. E.* T. rhei comp. *L. D.* T. rhei et aloes, *E.* T. rhei et gentianæ, *E.* T. scillæ, *L. D.* T. sennæ, *L.* T. sennæ comp. *E. D.* T. serpentariæ, *L. D.* T. aristolochiæ serpentariæ, *E.* T. valerianæ, *L. D.* Spiritus ammoniæ, *L.* Spt. anisi, *L.* Spt. anisi comp., *D.* Spt. armoraciæ comp. *L. D.* Spt. carui, *L. D.* Spt. cari carui, *E.* Spt. cinnamomi, *D.* Spt. lauri cinnamomi, *E.* Spt. juniperi comp. *L. E. D.* Spt. lavandulæ, *D.* Spt. menthæ piperitæ, *E.* Spt. myristicæ, *L.* Spt. myrist. moschatæ, *E.* Spt. nucis moschatæ, *D.* Spt. pimentæ, *L. D.* Spt. myrti pimentæ, *E.* Spt. rorismarini, *D.* Vinum aloes, *L. D.* Vin. colchici, *L.* Vin. ipecacuanhæ, *L.* Vin. opii, *L.* Vin. veratri, *L.* Vin. veratr. albi, *E.* Vin. gentianæ comp. *E.* Vin. rhei, *E.* Acetum colchici, *L. D.* Acet. scillæ, *L.* Acet. scill. maritimæ, *E.* Infusum gentianæ comp. *E.* Vin. ferri, *L.* Tinct. ferri ammoniati, *L.* Aquæ distillatæ, *L.* Aquæ stillatitiæ, *E.* Plumbi subacetatis liquor compositus, *D.* Extractum colocynthidis comp. *L. D.* Ext. nucis vomicæ, *D.* Ext. rhei, *L. D.*

ALLIUM.

Willd. *g.* 626; Spr. *g.* 1186.—*Hexandria Monogynia.*--Nat. ord. *Liliaceæ*, Linn. Jus.

Sp. ALLIUM SATIVUM. *Ed. Dub. Lond.*
Garlic.

Officinal.—The root.

ALLII RADIX. *Lond.* ALLII SATIVI RADIX. *Ed.* ALLII SATIVI BULBUS. *Dub.* [*].

GARLIC is a perennial bulbous-rooted plant, a native of Sicily, and cultivated in our gardens. The root consists of five or six small bulbs called *cloves*, inclosed in one common membranous coat, but easily separable from each other. All the parts of this plant, but more especially the bulb, have a strong offensive, very penetrating, and diffusible smell, and an acrimonious, almost caustic taste. The bulb is full of a limpid juice, of which it furnishes almost a fourth part of its weight by expression.

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[*] *Syn.* L'ail commun ou cultivé, (*Fr.*) Der Knoblauch ; der Garten-lauch, (*Ger.*) Aglio commune, (*It.*) Schaus, (*Hebr.*) Σκοροδον, (*Gr.*) Vūllay poondoo, (*Tam.*) Soodooloonoo, (*Cyng.*) Velligudda, (*Tel.*) Bavang pootie, (*Malay.*) Belluly, (*Can.*) Lássun, (*Duk.* and *Hind.*) Seer, (*Pers.*) Soom, (*Arab.*) Loshun, (*Beng.*) Lăsŭnă, (*Sansc.*) Késun, (*Bali.*)

The active ingredient is, according to Hagen, a yellowish thick ropy essential oil, in very small proportion, but in which alone reside the smell and taste. This is confirmed by Cadet De Gassicourt and Bouillon La Grange, who also found it to contain sulphur, vegetable albumen and saccharine matter. By decoction the virtues of garlic are entirely destroyed; but its peculiar virtues are in some degree extracted by alcohol and acetic acid.

Med. use.—It is sometimes used by the lower classes as a condiment, and also enters as an ingredient into many of the epicure's most favourite sauces. Taken in moderation, it promotes digestion; but in excess, it is apt to produce headach, flatulence, thirst, febrile heat, and inflammatory diseases, and sometimes occasions a discharge of blood from the hæmorrhoidal vessels. Internally, from its very powerful and diffusible stimulus, it is useful in diseases of languid circulation and interrupted secretion. Hence, in cold leucophlegmatic habits, it proves a powerful expectorant, diuretic, and, if the patient be kept warm, sudorific; it has also been by some supposed to be emmenagogue. For the same reason, in cases in which a phlogistic diathesis, or irritability, prevails, large doses of it may be very hurtful.

In this country garlic is scarcely prescribed by practitioners, and is not much used as a domestic remedy. Garlic may be exhibited in substance, and in this way several cloves may be taken at a time without inconvenience, or the cloves cut into slices may be swallowed without chewing. This is the common mode of exhibiting it for the cure of intermittents. Garlic may be given in the form of a pill or bolus conjoined with some powder. It may also sometimes be exhibited with advantage in the form of a clyster. An infusion of an ounce of bruised garlic in a pound of milk was the mode in which Rosenstein exhibited it to children afflicted with worms. Applied externally, it acts successively as a stimulant, rubefacient, and blister. In deafness, cotton moistened with the juice is introduced within the ear, and the application renewed five or six times in one day. Garlic made into an ointment with oils, &c. and applied externally, is said to resolve and discuss indolent tumours, and has been by some greatly esteemed in cutaneous diseases. It has likewise sometimes been employed as a repellent. When applied under the form of a poultice to the pubes, it has sometimes proved effectual in producing a discharge of urine, when retention has arisen from torpor of the bladder. Sydenham applied garlic as a revulsive in the confluent small-pox, about the eighth day, after the face began to swell. The root cut in pieces, and tied in a linen cloth, was applied to the soles, and renewed once a-day till all danger was over.

Off. Prep.—No preparation of garlic is retained in the British Pharmacopœias, but it enters as an essential ingredient into the genuine *Vinaigre des quatre voleurs.*

Sp. 17. Spr. ALLIUM CEPA. *Dub.*[*].
Onion.

Officinal.—The root.
CEPÆ BULBUS. *Dub.*

THIS is also perennial. The root is a simple bulb, formed of concentric circles. It possesses in general the same properties as the garlic, but in a much weaker degree. When distilled by Neumann, the whole flavour of the onion passed over, but no oil could be obtained.—Wiegleb says, that all this class of vegetables, as well as the acrid cruciform, owe their acrimony to a subtile essential oil, and that they contain combined ammonia, which can be obtained by distillation with a solution of potass. Vauquelin ascribes the acrimony of onions to volatile oil combined with sulphur, and its sweetness to uncrystallizable sugar with mucus, gluten and animo-vegetable matter.

Medical uses.—Onions are considered rather as an article of food than of medicine: by their stimulating quality they tend to excite appetite, and promote the secretions; but when eaten liberally they produce flatulence, occasion thirst, headach, and disturbed dreams. By some they are strongly recommended in suppression of urine, and in dropsies. The chief medicinal use of onions is their external application, as a cataplasm for suppurating tumours, &c.

Sp. 8. Spr. ALLIUM PORRUM. *Lond.*[†].
Leek.

Off.—The root.
PORRI RADIX. *Lond.*

THE common leek is rather an article of the Materia Alimentaria, than of the Materia Medica. It is milder even than the common onion. A decoction of the beards or radicles from the bulbs is supposed by the vulgar to be lithontriptic.

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[*] *Syn.* L'oignon, (*Fr.*) Zwibellauch, (*Ger.*) Cipolla, (*It.*) Venggāyum, (*Tam.*) Loono, (*Cyng.*) Peeaj, (*Hind.*) Bússúl, (*Arab.*) Peeāz, (*Pers.*) Sukandaka, (*Sansc.*) Κρομμυον, (*Diosc.*)

[†] *Syn.* Le poireau, (*Fr.*) Der Lauch, der Porre, (*Ger.*) Porro, (*It.*)

ALOE [*].

Willd. *g.* 659; Spr. *g.* 1218.—*Hexandria Monogynia.*—Nat. Ord. *Liliaceæ,* Linn. & Juss.

Sp. 60. Spr. ALOE VULGARIS, De Candolle. *Dub.*

Off.—The extract, called Hepatic Aloes.

ALOE HEPATICA; Extractum. *Ed.* ALOE HEPATICA. *Dub.*

THIS species, which is indigenous in Greece, Italy, and Sicily, as well as in the West Indies, Brazil, and Malabar, is said by Dr Sibthorpe to have produced the aloes of the ancients. It is extensively cultivated in Barbadoes for the sake of the extract prepared from its leaves, called Barbadoes or Hepatic Aloes. In Barbadoes the plant is pulled up by the roots, and carefully cleaned from the earth and other impurities. It is then sliced into small hand-baskets and nets, which are put into large iron boilers with water, and boiled for ten minutes. The leaves are then taken out, and fresh parcels supplied till the liquor is strong and black. This is next strained into a deep vat, narrow at bottom, where it is left to cool and to deposite its feculent parts. Next day the clear liquor is drawn off by a cock, and again put into a large iron vessel. At first it is boiled briskly, but towards the end it is slowly evaporated, and requires constant stirring to prevent burning. When it becomes of the consistence of honey, it is poured into gourds or calabashes for sale, and hardens by age. De Candolle says, that the *Aloe vulgaris* yields both the hepatic and the caballine aloes of the shops.

Sp. 69. Spr. ALOE SOCOTORINA [†], De Candolle.

THIS species is indigenous in the Island of Socotora or Zocotora, and cultivated in Barbadoes.

Dr Ainslie, in his late work, which abounds with valuable information on the productions of India, tells us that the aloes used in India is brought from the Cape of Good Hope, or from the Island of Zocotora. He considers them both as produced from the same species, which grows in abundance in Zocotora, and also in many parts of the south of

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[*] *Syn.* Aloe Barbadensis, Miller; Aloe perfoliata, var. γ. Barbadensis Hort. Kew.; var. λ. vera Willd.; var. π. vera Linn. species; A. elongata, Murray; A. humilis β, Willd. Αλοη, (*Gr. Diosc.*) Zabbara, (*Sicil.*) Kadanaka, Catavela, (in *Malabar*, *Rhude.*) Caraguata, Erva babosa, (in *Brazil*, *Margraave.*) Lohojie, (*Egypt.*)

[†] *Syn.* Aloe perfoliata *a.* minor. (*Bot. Mag.*) Aloe sinuata, (*Thunberg.*) Aloe vera, (*Miller.*)

Africa, such as the kingdom of Melinda, where the greater part of the extract is prepared that is now sold under the name of Socotorine Aloes. According to De Candolle, it has also the names of *Opium thebaicum, Terebinthina venetæ,* and *Crocus orientalis.*

The plant rises three or four feet in height, has generally a dusky hue, and when cut, there exudes an amber coloured viscid juice, which has much of the taste and smell of socotorine aloes.

It is prepared in July, by pulling off the leaves, from which the juice is expressed, and afterwards boiled and skimmed. It is then preserved in skins, and dried in August in the sun. According to others, the leaves are cut off close to the stem, and hung up. The juice, which drops from them without any expression, is afterwards dried in the sun.

Sp. 72. Spr. ALOE SPICATA. *Lond.* Persoon. *Dub.*

Off.—The gum resin or extract, called Socotorine Aloes.
ALOES SPICATÆ EXTRACTUM. *Lond.* ALOE SOCOTORINA. *Ed.*

THIS species is a native of the Cape of Good Hope. It is allowed by De Candolle to yield the best aloes; and Thunberg, upon whose authority this is stated, tells us, that the Hottentots cut off the leaves, and arrange them so that the lower serves as a gutter to conduct the juice into a calabash, which is then brought near a fire, and the liquor reduced to one-half. It is prepared at all seasons; but after the rains, the leaves, which in general yield little juice, furnish it more abundantly, but of a weaker quality, and containing less extract. But although set down by the London and Dublin Colleges as furnishing the socotorine aloes, De Candolle's statement of its being the product of *A. socotorina* is to be preferred.

I know not to what botanical species the following observations of Dr Ainslie refer.

"There is another sort of aloes common in the Indian bazaars, of very inferior quality, resembling more what is called in Europe Barbadoes Aloes. It is more dusky in colour, has not the pleasant smell the other (A. Socot.) has, and is extremely bitter. It is brought from Yemen in Arabia to the western parts of the Peninsula. It is the product of a much larger plant * than the other, which rises to the height of ten or twelve feet, with narrowish leaves of a sea green colour, very succulent."

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* Taruni, (*Sansc.*) Ghrita koomārie, (*Hind.* and *Bengal.*) Kattālay, (*Tam.*) Ravana, (*Can.*) Herba babosa, (*Portug.*) Dr Ainslie tells us that there is a coarse kind of aloes, called *Musambrum*, common in the bazaars, which is perhaps prepared in India from this species.

Nor do I know from what species the common Cape aloes is got; probably from many. During the first four years that the Cape of Good Hope was in possession of the British, more than 300,000 pounds, the produce of that settlement, were imported into England; and as this quantity was infinitely greater than could be required for the purposes of medicine, it is not improbable, that, as Mr Barrow states, its principal consumption was by the London porter brewers.

From those specified, and perhaps kindred species, the various kinds of aloes which occur in commerce are obtained. M. Fee does not think that each of the commercial varieties is produced by a particular species, but considers the extract as a product of the genus. Also in the *Dictionaire des Drogues*, it is stated by Richard, that the three commercial varieties are the product of the same operation, which he describes a little differently from what has been already mentioned from original authority. He says, that the leaves of every species are collected and bruised, with the addition of water. The expressed pulp is then boiled in water, and the filtered and decanted decoction mixed with the expressed juice. The whole is then heated, which separates the parenchyme. It is again filtered, boiled down to a proper consistence, and poured into coolers while still warm. The upper layer is separated, as being of the first quality, or, as he calls it, *aloes citrin;* the middle layer is the hepatic, or *aloes jaune;* while the bottom is the caballin, or *aloes noir.* I do not, however, think that the genuine sorts can be procured in this way, which would not account for the great difference in smell and taste. It may, however, furnish varieties, sold each under the names of that genuine variety which it resembles in appearance. However this may be, the chief varieties in commerce are,

1. *Socotorine aloes* *, which is the most esteemed, is brought, wrapped in skins, from the island of Socotora in the Indian Ocean. It is dark coloured, of a glossy clear surface, and in some degree pellucid; in mass of a yellowish-red colour, with a purple cast; fracture unequal; easily pulverizable; when reduced to powder, of a bright golden colour. It is hard and friable in the winter, somewhat plastic in summer,

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* Cárriabōlum, (*Tam.*) Catasha, (*Mal.*) Moosumbir, (*Duk.*) Comarika, (*Cyng.*) Oolowaton, (*Malay.*) Moosumbrum, (*Tel.*) Sibbir, (*Pers.*) Eyluwa, *Hind.*)

and growing soft between the fingers. Its taste is bitter and disagreeable, though accompanied with some aromatic flavour; the smell is not very unpleasant, and somewhat resembles that of myrrh. It is said not to produce hæmorrhoidal affections so readily as Barbadoes aloes.

2. *Hepatic aloes* is of two kinds, one from the East Indies, the other from Barbadoes. The former has a light brown, or reddish-yellow colour; a clean fracture, and possesses nearly the same medical properties as the socotorine. Barbadoes aloes is not so clear and bright as the socotorine; it is also of a darker colour, more compact texture, and for the most part drier, though not so brittle. Its smell is much stronger and more disagreeable; the taste intensely bitter and nauseous, with little or nothing of the aromatic flavour of the socotorine. The best hepatic aloes from Barbadoes is in large gourd shells; and an inferior sort, which is generally soft and clammy, is brought over in casks. Barbadoes aloes is extremely apt to induce hæmorrhoids; but it is generally preferred, because it is very difficult to adulterate it without altering its appearance, and because it is more active.

3. *Fetid, caballine, or horse aloes.* This is easily distinguished from both the foregoing kinds by its strong rank smell; although, in other respects, it agrees pretty much with the hepatic. Sometimes the caballine aloes is prepared so pure and bright, as not to be distinguishable by the eye even from the socotorine; but its offensive smell, of which it cannot be divested, readily betrays it. Its fracture also resembles that of common rosin, with which it is often adulterated, whereas the fracture of socotorine aloes is unequal and irregular.

Since it is probable that only the finest aloes is truly a concrete juice, and that the greater part of what occurs in commerce is an extract, it is not surprising that the analysis of this drug by different chemists should essentially differ. Two opinions as to its nature may be mentioned. One is that of Braconnot, who considers it to consist of 26 parts of what he calls *principe puce*, or flea-coloured principle, without smell, and almost without taste, very soluble in alcohol, scarcely soluble in boiling water, insoluble in oil of turpentine, and soluble in concentrated sulphuric acid, and in alkalies; and of 73 of *resino-amer*, entirely soluble in 37 waters, at 104° F, very soluble in alcohol of 38° B. especially when heated, and insoluble in olive oil or oil of turpentine. The other opinion is that previously entertained by chemists, and still generally received. It considers aloes as consisting of various principles. According to old Neumann's analysis, 1000 parts of aloes contain about 7.8

soluble in water only, or analogous to gum, 94 soluble in alcohol only, or resinous matter, and 895 soluble both in alcohol and in water, or extractive. Different proportions have been got by other chemists, from different varieties of aloes. Trommsdorff made socotorine aloes consist of 25 resin, 74.4 bitter principle, 0.6 of fibre; and Bouillon Lagrange and Vogel, of 32 resin, and 68 of bitter principle; while in hepatic aloes, Trommsdorff found 6.25 resin, 81.25 bitter principle, 12.5 coagulated albumen, and a trace of gallic acid; and B. Lagrange and Vogel, 42 resin, 52 bitter principle, and 6 coagulated albumen. The hepatic aloes examined was therefore probably a concrete juice, the socotorine aloes an extract. The resins of all the sorts, purified by alcohol, have little smell; that obtained from the socotorine has scarcely any perceptible taste; that of the hepatic is slightly bitterish; and the resin of the caballine has a little more of the aloetic flavour. The extractive obtained separately from any of the kinds is less disagreeable than the crude aloes; the extractive of socotorine aloes has very little smell, and is in taste not unpleasant; that of the hepatic has a somewhat stronger smell, but is rather more agreeable in taste than the extract of the socotorine: the extractive of the caballine retains, in some degree, its peculiar rank smell, but its taste is not much more unpleasant than that of the extractive obtained from the two other sorts. Pfaff examined the properties of the extractive of aloes, which, for convenience, he called Aloesine. When dry it has a red brown colour, is translucent in thin fragments, has a very bitter taste and a weak smell, something like saffron. In powder it has a beautiful yellow colour. It is perfectly soluble in water and in alcohol, and is insoluble in ether. Its solution does not redden litmus, but gives a bluish green to reddened litmus paper. Its colour is deepened by alkalis, and rendered paler by acids, and clearer by alum. It is not affected by solution of gelatine, tincture of nut-galls, muriate or oxymuriate of tin, tartar emetic, solutions of copper, zinc, or manganese. It is copiously precipitated by protonitrate of mercury and acetate of lead; less copiously by nitrate of lead and nitrate of silver. Solutions of peroxide of iron give a dark colour without precipitate. Lastly, it keeps long in a state of solution without change by fermentation or moulding.

Some are of opinion, that the purgative virtue of aloes resides entirely in its resin; but experience has shewn, that the pure resin has little or no purgative quality, and that the extractive part separated from the resinous acts more powerfully than the crude aloes. If the aloes indeed be made to undergo long coction in the preparation of the extract, its cathartic power will be considerably lessened, not from the separation of the resin, but from an alteration made in the extractive itself by the action of the heat and air. The strongest vegetable cathartics become mild by a similar treatment.

Med. use.—Aloes in doses of two grains or less is a stomachic, and with this intention is an ingredient of the various *Pilulæ ante cibum*. In larger doses it acts as a purgative, but its operation is tardy, first manifesting itself eight or twelve hours after it has been taken. It is therefore frequently given at bedtime. It also acts in a small dose, and hence is conveniently given in pills, which obviates the bitter taste. Wedekind thinks that its primary action is not upon the intestines, but upon the liver; and hence it is to be used whenever we wish to increase the secretion of bile, and correct the atony of the liver. It is particularly adapted to persons who lead a sedentary life.

Aloes is a bitter stimulating purgative, exerting its action chiefly on the rectum. In doses of from 5 to 15 grains it empties the large intestines, without making the stools thin; and likewise warms the habit, quickens the circulation, and promotes the uterine and hæmorrhoidal fluxes. If given in so large a dose as to purge effectually, it often occasions an irritation about the anus, and sometimes a discharge of blood.

It is frequently employed in cases of suppression of the menses, or of the hæmorrhoidal discharge; but it is particularly serviceable in habitual costiveness, to persons of a phlegmatic temperament and sedentary life, and where the stomach is oppressed and weakened. For its use in typhus fever, scarlatina, cynanche maligna, marasmus, chlorosis, hæmatemesis, chorea, hysteria, and tetanus, Dr Hamilton's excellent work on Purgatives may be consulted. Aloes is also used as an anthelmintic, both given internally and applied to the abdomen in the form of a plaster. Dissolved in alkohol, it is employed to check hæmorrhagies in recent wounds, and as a detergent in ulcers.

From its warmth and activity it is accused of causing colic pain, bloody stools, and other hæmorrhagies, and has been proscribed in persons of a plethoric, nervous and dry habit of body, in pregnant women, and in fevers and inflammations generally, yet it is often given in these with advantage.

Aloes is administered either,

a. Alone, or

b. In composition: with purgatives, as soap, scammony, colocynth, rhubarb; with aromatics, as canella; with bitters, as gentian; with tonics, as iron, myrrh; with fetids, as assafœtida.

It is exhibited in the form of

a. Powder; too nauseous for general use.

b. Pill; the most convenient form.

c. Solution in water, wine or diluted alcohol.

Dose.—The effect of aloes is by no means proportioned to its dose, so that a few grains operate nearly as well as several times the number. Five, ten, or fifteen grains may be given in a single dose as a purgative, but against a costive habit two or three grains daily will generally suffice. Corresponding quantities may be given in solution, and the action is more speedy. Some foreign therapeutists assert, but connected with a hypothesis as to its mode of action, that aloes has absolutely no effect when thrown into the rectum as a clyster.

Off. Prep.[†].—Pulvis aloes comp. *L.* * *D.* Pulvis aloes cum canella, * *D.* Pilulæ al. comp. *L.* * *D.* Pil. aloeticæ, *E.* Pil. al. cum myrrha, *L. L.* * *D.* Pil. al. et assafœtidæ, *E.* Pil. Gambogiæ comp. *L. E.* * *D.* Pil. colocynthidis comp. *E.* * *D.* Tinctura aloes, *L. D.* Tinct. al. socot. *E.* Tinct. al. comp. *L. D.* Tinct. al. et myrrhæ, *E.* Tinct. benzoini comp. *L. E. D.* Tinct. rhei et aloes, *E.* Tinct. al. ætherea, *E.* Vinum aloes, *L. D.* Vin. al. socot. *E.* Decoctum al. comp. *L.* * *D.* Extractum aloes purificatum, *L.* Extractum al. hepaticæ, * *D.* Extr. colocynthidis comp. *L.* * *D.*

ALTHÆA OFFICINALIS[‡]. *Ed. Lond. Dub.*

Willd. *g.* 1289, *sp.* 1; Spr. 2442, *sp.* 6; *Smith's Flor. Brit. g.* 316, *sp.* 1.—*Monadelphia Polyandria.*—Nat. ord. *Columnaceæ,* Linn., *Malvaceæ,* Juss.

Marsh-mallow.

Off.—The root and leaves.

a) ALTHÆÆ OFFICINALIS RADIX. *Ed. Dub.* ALTHÆÆ RADIX. *Lond.*

b) ALTHÆÆ OFFICINALIS FOLIUM. *Ed. Dub.* ALTHÆÆ FOLIA. *Lond.*

THE marsh-mallow is a perennial indigenous plant, which is found commonly on the banks of rivers, and in salt marshes. But in some parts of the Continent it is cultivated in great quantities for medical use, and moist sandy soils are preferred. The whole plant, but especially the root, abounds with mucilage. The root of commerce is furnished also by other *Malvaceæ.* M. Adam, apothecary at Metz, says it is furnished, of a very white colour, by the *Malva alcea*, the branches of which are not forked as those of the marsh-mallow. The root which comes from Germany by the way of Strasburg is much whiter than that of the south of France, but not as thick. Certain districts of France are celebrated for producing it of fine quality.

[†] The London and Edinburgh colleges use the socotorine aloes in making all the preparations; the Dublin college more frequently prescribes the Barbadoes. The latter are distinguished by an asterisk prefixed.

[‡] *Syn.* La Guimauve ordinaire, (*Fr.*) Eibischwürzel; weisse Pappel, (*Ger.*) Malva visco; bismalva, (*Ital.*) Αλθαια, (*Gr.* Dios.)

The root is generally found in the shops in pieces of from 3 to 4 inches long, of the thickness of a finger. It should be chosen plump, and little fibrous; with a very white surface, well cleared of its yellowish epidermis, downy from the mode of dressing it with files; of a faint smell, and very mucilaginous taste. In our shops it is often found unpeeled, which both renders it more apt to become mouldy from being dried less rapidly, and gives an unpleasant colour and taste to the decoction. It contains much mucilage, with some saccharine principle. M. Bacon thought that he had discovered a new principle in mallow root, to which he gave the name of Altheine; but M. Plisson, after a careful examination, determined its identity with the asparagine of Robiquet. I found that the decoction of the root reddens turnsole, and gelatinizes silicized potass.

The leaves are cordiform and downy; and retain a fine green colour when dried. They also are very mucilaginous.

Med. use.—The root in decoction is used internally as an emollient and demulcent in diseases attended with irritation and pain, as in various pulmonary complaints, and in affections of the alimentary canal and urinary organs; and it is applied externally in emollient fomentations, gargles and clysters. A favourite lozenge is named from it, *Pate de Guimauve.* The leaves are demulcent, and may be used in decoction.

Off. Prep.—Decoctum althææ, *D.* Decoct. alth. officinalis, *E.* Syrupus althææ, *L. D.* Syrupus alth. officin. *E.*

ALUMEN [*]. Sulphas aluminæ et potassæ. *Ed. Dub.*
ALUMEN, S. S. Supersulphas aluminæ et potassæ. *Lond.*
Supersulphate of alumina and potass. Alum.
Sulphate of alumina and potass.

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[*] *Syn.* Alun, (*Fr.*) Alaun, (*Germ.*) Allume, (*It.*) Paddicārum, (*Tam.*) Puttica, Sputicca, (*Sans.*) Chinakarum, (*Cyng.*) Shebb, (*Arab.*) Púttákārie, (*Duk.*) Zajbelur, (*Pers.*) Paddicāra, (*Tel.*) Pedrahume, (*Port.*)

Alum is obtained principally from schistose clays, which are intimately incorporated with iron pyrites.

The Alum works of Hurlet and Nitshill, in the vicinity of Paisley, are supplied with aluminous schist from the old workings of coal pits in the neighbourhood. The schist, after being long exposed to a still, humid, subterranean atmosphere, is more or less split into layers, by the efflorescence (crystallization) of the sulphates of alumina and iron in its substance. By lixiviation these are extracted, and the two salts are separated from one another by the greater insolubility of the sulphate of iron, which crystallizes, while the sulphate of alumina still remains dissolved. A solution of a salt of potash is now added to the solution of the sulphate of alumina, to form alum. The addition of an alkali is absolutely necessary, as alum is a triple or even quadruple salt, with excess of acid, consisting of sulphuric acid and alumina, with potass or ammonia, or both of them. After several solutions and crystallizations the alum is rendered very pure.

When no more salts can be procured from the schist by lixiviation, it is piled into heaps, along with brushwood and coals, and the whole set on fire. The combustion is kept as languid as possible; and, after it is finished, the schist is lixiviated. By the process of roasting which the schist has undergone, a quantity of sulphate of alumina is formed, but the sulphate of iron is destroyed by the heat. Alum is formed from the sulphate of alumina now procured, by the process already described.

Near Whitby there are considerable works where alum is made, by burning a sulphuret of alumina, which is found there in the form of a soft grey clay, lying under a stratum of sandstone, and by adding muriate of potass to the ley of sulphate of alumina thus obtained.

Alum crystallizes in regular octohedrons, whose sides are equilateral triangles. It has a sweetish but very astringent taste. It is soluble in 15 times its weight of water at 60°, and in three-fourths of its weight at 212°. It reddens vegetable blues. It effloresces slightly in the air. By the action of heat it first undergoes the watery fusion, then loses its water of crystallization, and lastly great part of its acid. It is decomposed by baryta, potass, soda, strontia, and all salts of which these are the bases; by the nitrate, muriate, phosphate, carbonate, borate, and fluate of ammonia; by the nitrate, muriate, phosphate, and carbonate of magnesia; and by the nitrate, muriate, and carbonate of lime. It is also decomposed by the gallic acid, by colouring matters, and by many animal and vegetable substances.

There are three varieties of alum, which agree in the form of their crystals, and in some particulars of their composition. They all contain 25 atoms of water of crystallization, and 3 atoms of sulphate of alumina; but in the most common variety there also exists an atom of sulphate of potash; in the other varieties there is an atom of sulphate of soda, or of sulphate of ammonia. Dr Thomson has pointed out how singularly they differ in their solubility in water. The medical properties of alum do not seem to be affected by the nature of the alkali.

Med. use.—Alum is a powerful astringent; it is reckoned particularly serviceable for restraining hæmorrhagies and immoderate secretions; but less proper in intestinal fluxes. In violent hæmorrhagies, it may be given in doses of fifteen or twenty grains, repeated every hour or half hour till the bleeding abates. It is used also externally, in astringent and repellent lotions and collyria. Dr Scudamore has recommended greatly a saturated solution of alum in free doses in hæmoptysis and hæmatemesis. In other cases, smaller doses are more advisable, large ones being apt to nauseate the stomach, and occasion violent constipation of the bowels. Burnt alum, taken internally, has been highly extolled in cases of colic. In such instances, when taken to the extent of a scruple for a dose, it has been said gently to move the belly, and give very great relief from the severe pain.

Off. Prep.—Alumen exsiccatum, *L. E.* Al. siccatum, *D.* Cataplasma aluminis, *D.* Pulvis aluminis comp. *E.*

AMMONIACUM. *Gummi resina. Lond. Ed. Dub.*
Ammoniac, a gum-resin *.

AMMONIACUM is a concrete juice, the produce of Persia, and sent to Europe from Bombay or Alexandria.

Gum-ammoniac is now referred by the British Colleges, on the authority of Willdenow, to the *Heracleum gummiferum*, which he raised from seeds taken out of the Ammoniacum of the shops; while he admits that he could not procure any gum from the plants raised at Berlin, nor had they any of the sensible qualities of ammoniac. As far back as 1811, I pointed out the insufficiency of the evidence; and from the description of the ammoniac plant of Barbary by Mr Jackson, I stated my opinion, that it was totally different from the *Heracl. gummif.* of Willd.; and in 1826, after having the opportunity of comparing the figures of both plants, I was confirmed in my opinion. Since that time, if any additional arguments were wanting, they are supplied by the description and figure of the true ammoniac plant of Persia by Colonel Johnson and by Captain Hart, and by its appearing that the *Heracl. gummif.* of Willd. is an European plant, *Heracl. pyrenaicum*, not uncommon in Switzerland, which yields no juice on being wounded, and is quite destitute of the sensible qualities of ammoniac.

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* *Syn.* Gomme ammoniaque, (*Fr.*) Ammoniak-gummi, (*Ger.*) Gomma ammoniaco, (*It.*) Ushék, (*Arab.* and *Duk.*) Feshook, (*Duk.*) Semugh bilshereen, (*Pers.*)

The descriptions of the plant, as observed in Morocco, by Mr Jackson, and in Persia by the military travellers, coincide as nearly as could be expected from accurate observers, not botanists. Mr Jackson says, "*Ammoniacum*, called *Feshook* in Arabic, is produced from a plant similar to the European fennel, but much larger. In most of the plains of the interior, and particularly about El Araiche and M'sharrah Rummillah, it grows ten feet high. The Gum-ammoniac is procured by incisions in the branches, which, when pricked, emit a lacteous glutinous juice, which being hardened by the heat of the sun, falls on the ground, and mixes with the red earth below. The gum, in the above-mentioned state, is used in all parts of the country for cataplasms and fumigations. The sandy light soil which produces the gum-ammoniac abounds in the north of Morocco. It is remarkable that neither bird nor beast is seen where this plant grows, the vulture only excepted. It is, however, attacked by a beetle, having a long horn proceeding from its nose, with which it perforates the plant, and makes the incisions whence the gum oozes out."

Colonel Johnson's description is too long for quotation, but the identity of the plant appears from its name being *Oshauk.* "It grows to about six feet high, some of the stems being of a dark colour, like ripe sugar-cane, and others of a light green, tinged with lake colour near the joints." The flowers are totally different from those of the *Heracleum.* "Each flower *(umbellula)* adheres by a small shank to the flower stem, and is round, and of the size of a pea, appearing to be composed of a number of smaller flowers, not much larger than the size of pins' heads. These, when examined by the microscope, exhibit five leaves, curling inwards, each holding a seed (*anther*) of the shape of a kidney." In the latter end of June, and from that period until the end of July, the lower leaves turn yellow, and the plant becomes ripe. But in the month of May, while the plant is soft, an insect of the beetle kind begins to puncture the stem in every direction with his proboscis, which seems well adapted to the purpose. As the stem shrinks and dries, there exudes from these punctures a milky juice, which flows down and indurates near the joints, where it is gathered by the inhabitants of the adjacent countries about the latter end of July." The quantity collected from one plant is somewhat less than a pound.

Captain Hart calls the plant Oshac. One of the finest measured seven feet two inches high, and the stem four inches in circumference at the base. It grows principally on the plains between Yerdekaust and Kumisha, in the province of Irauk, without cultivation. "The gum is so abundant, that upon the slightest puncture being made, it instantly oozes forth, even at the ends of the leaves. When the plant has attained perfection, innumerable beetles armed with an anterior and posterior probe of half an inch in length, pierce it in all directions. It soon becomes dry, and is then picked off, and sent *via* Bushire to India."

By these quotations the question as to Gum-ammoniac being the produce of a *Heracleum* should be set at rest. Whether the Bavarian Pharmacopœia is right, in referring it, with Olivier, both to the *Ferula orientalis* growing in Asia Minor, the Tauris and Numidia, and, with Sprengel, to the *Ferula Ferulago* of Desfontaines, growing in Sicily and North Africa, I am unable to determine.

Gum-ammoniac occurs in commerce chiefly in two forms, either in separate tears, or in masses formed of these tears, agglutinated by a clammy matter, and often mixed with sand, bits of vegetables, and other impurities. The tears are whitish, but become yellow by the action of the air, shining, opaque, irregular in shape, more or less globular, the smaller chiefly angular; when cold, rather hard and brittle, fracture conchoidal, softened by the heat of the hand; with a peculiar heavy unpleasant smell, and a nauseous taste, at first mucilaginous and bitter, and afterwards acrid. It is not fusible, but burns with a white crepitating flame, with little smoke, but a strong smell. When triturated with water it is partly dissolved, forming an emulsion, gradually becoming clearer on standing. Alcohol takes up scarcely a half by digestion, forming a brownish yellow solution. It should be kept in tinned iron boxes.

Neumann extracted from 480 parts, 360 by alcohol, and then by water 105; by water applied first 410, and then by alcohol 60. Alcohol distilled from it arose unchanged, but water acquired a sweetish taste, and the smell of the ammoniac. More modern chemists say that the spirit drawn from it by distillation smelt strongly of the gum, and that a small portion of a very pungent strong smelling oil could be got from it. The solution in alcohol is transparent; but on the addition of water becomes milky. It is more completely soluble in volatile oil, ethereal spirits, and ammoniated alcohol. Ammoniac therefore seems to consist principally of a substance soluble both in water and in alcohol, combined with some volatile matter. Hagen found 686 resin, 193 gum, 54 gluten, (bassorine,) 16 extractive, and 23 sand = 1000. Braconnot 700 resin, 184 gum, 44 gluten, and 60 water.

Such tears as are large, dry, free from small stones, seeds, or other impurities, should be picked out and preferred for internal use; the coarser kind is purified by solution, colature, and careful inspissation; but unless this be artfully managed, the gum will lose a considerable deal of its more volatile parts. There is often vended in the shops, under the name of strained gum ammoniacum, a composition of ingredients much inferior in virtue.

Med. use.—The general action of gum-ammoniac is stimulant. On many occasions, it proves a valuable antispasmodic, deobstruent, or expectorant. In large doses, it purges gently, excites perspiration, and increases the flow of urine. It is used with advantage to promote expectoration in some pulmonary diseases, especially asthma and chronic catarrh; to augment the flow of urine in dropsical affections, and to support the salivation in small pox. It is also frequently prescribed for removing obstructions of the abdominal viscera, and in hysterical disorders, occasioned by a deficiency of the menstrual evacuation. In long and obstinate colics, proceeding from viscid matter lodged in the intestines, this gummy resin has produced good effects, after purges and the common carminatives had been used in vain. Externally, it is supposed to soften and ripen hard tumours, is often applied as a discutient in white swellings of the knee and other indolent tumours.

It is exhibited externally,

a. In solution, combined with vinegar, vinegar of squills, assa fœtida, &c.

b. In pills, with bitter extracts, myrrh, assa fœtida.

c. And externally, dissolved in vinegar, combined with turpentine, common plaster, &c.

Dose.—As an expectorant, it may be given in doses of from ten to twenty grains, in the form of pill, or the same quantity in the form of an emulsion. Larger doses are rarely given in cases of visceral obstruction or difficult menstruation.

Off. Prep.—Mistura ammoniaci, *L. D.* Pilulæ scillæ comp. *L. E. D.* Emplastrum ammoniaci, *L. D. E.* Emplast. gummosum, *E.* Empl. ammon. cum hydrargyro, *L. D.*

AMMONIÆ MURIAS. *Lond. Dub.* MURIAS AMMONIÆ. *Ed.* Muriate of ammonia. Sal ammoniac *.

MURIATE of ammonia is found native, especially in the neighbourhood of volcanoes. It was first prepared in Egypt from the soot of camel-dung by sublimation; but the greatest part of that now used is manufactured in Europe, either by combining ammonia directly with muriatic acid, or by decomposing the muriates of lime and magnesia by means of carbonate of ammonia; or, what is most common, the sulphate of ammonia by means of muriate of soda. The sulphate of ammonia for this purpose is got by lixiviating the soot of sulphureous coal; or by heating to redness bones with gypsum, which gives rise to sulphate of ammonia and carbonate of lime. The former is separated by lixiviation.

In commerce, muriate of ammonia occurs, either sublimed in firm, round, elastic, concavo-convex cakes, or crystallized in conical masses. The latter commonly contain other salts, especially muriate of lime, which renders them deliquescent; and, therefore, the sublimed muriate of ammonia is to be preferred for the purposes of medicine.

Muriate of ammonia has an acrid, pungent, urinous taste. It is soluble in about three times its weight of water at 60°, and in its own weight at 212°. During its solution, it produces 32° of cold. It is also soluble in about 4.5 parts of alcohol. It is permanent in the ordinary state of the atmosphere. By a gentle heat, it is reduced to the form of a white powder. At a temperature below redness it sublimes unchanged without previous fusion. Its crystals are either six-sided pyramids, aggregated in a plumose form, or, still more commonly, four-sided pyramids. It is an anhydrous salt, and consists of 1 equivalent of muriatic acid 4.625, and 1 equivalent of ammonia 2.125; or of 1 of chlorine 4.5, 1 of nitrogen 1.75, and 4 equivalents of hydrogen $0.5 = 6.75$. It is decomposed by the sulphuric and nitric acids; by baryta, potass, soda, strontia, and lime; by several secondary salts containing these acids or bases; and by those metalline salts whose bases form with muriatic acid an insoluble compound.

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* *Syn.* Sel ammoniac, (*Fr.*) Salmiak, (*Ger.*) Sale ammoniaco, (*Ital.*) Náváchárum, (*Tam.*) Urmeena, (*Arab.*) Nowshāder, (*Pers.*) Vayvagarra loonoo, (*Cyng.*) Nuosadur, (*Sans.*)

Med. use.—Muriate of ammonia is, in this country, seldom used internally. On the Continent, especially in Germany, it has been and still is much employed. It acts primarily on the intestinal canal, like most of the other salts, as an irritating stimulus. By absorption it seems to reduce moderately the action of the heart and arteries; but it obviously excites the capillary system, both arterial and venous, the lymphatic vessels and glands, the skin, kidneys, and especially the mucous membranes, of which it not only increases the secretion, but also improves, according to the German physiologists, the vegetative process, or organic change of substance, and thus counteracts its frequently occurring morbid states, such as swelling, thickening, softening and atony. It promotes also the cuticular transpiration, and perhaps the menstruation. Its action even extends to the serous and fibrous membranes. On the kidneys its operation is less evident. In large doses it purges, but in small doses it rather constipates the bowels. It may be given for a long time without any inconvenience, but at last it impairs the digestive powers.

It is used in slight inflammatory and irritative fevers, and especially at the period of the crisis, before passing to a more stimulating treatment. It is employed, in particular, in catarrhal and rheumatic fevers. In exanthematic fevers it is especially indicated when the eruption is tardy. It is used with great advantage in pneumonia, bronchitis, pulmonary catarrh, and other mucous and serous inflammations, when their first violence is abated; also in inflammations of the liver and peritoneum. In tubercular phthisis its employment is very doubtful. It is highly beneficial in diseases of the phlegmatic temperament, as mucous hæmorrhoids, increased mucous secretion of the alimentary canal, catarrhal phthisis, *catarrhus vesicæ*, leucorrhœa, &c. likewise in indolent tumors and infarctions, especially of the abdominal viscera, in diseases of digestion, and in hypochondriasis, jaundice and worms. It is given in dropsies. Sundelin praises it in amenorrhœa, depending upon atony of the uterus, and in subinflammatory chlorosis.

Externally applied, it is a valuable remedy. It may act in two ways.

1. By the cold produced during its solution. It is from

this cause that cold lotions of muriate of ammonia probably prove beneficial in mania, apoplexy from plethora, lesions of the head, and in violent headachs. When used with this intention, the solution should be applied as soon as it is made.

2. By the stimulus of the salt. On this principle we may explain its action as a discutient, in indolent tumours of all kinds, contusions, gangrene, psora, ophthalmia, cynanche, and in stimulating clysters. In some cases, as in chilblains, and other indolent inflammations, both modes of action may be serviceable. When first applied, the coldness of the solution will diminish the sense of heat and uneasiness of the part, and the subsequent stimulus will excite a more healthy action in the vessels.

Dose.—It may be given in the form of powder, to the extent of 5–30 grains every two or three hours, mixed with powdered gum or sugar, or dissolved with syrup, mucilage, extract of liquorice, &c.

Off. Prep.—Ferrum ammoniatum, *L.* Murias ammoniæ et ferri, *E.* Ammoniæ carbonas, *D.* Ammon. subcarbonas, *L. E.* Liquor ammoniæ, *L.* Aqua ammoniæ, *E.* Ammoniæ causticæ aqua, *D.* Aqua carbonatis ammoniæ, *E. D.* Liquor ammon. subcarbonatis, *L. E.* Alcohol ammoniatum, *E.* Spiritus ammoniæ, *L. D.* Hydrosulphuretum ammoniæ, *D.*

AMOMUM *.

Willd. *g.* 4. Spr. *g.* 11.—*Monandria Monogynia.*—Nat. ord. *Scitamineæ*, Linn., *Ammomeæ*, Juss., *Drymyrrhizæ*, Decandolle.

Sp. 1. AMOMUM ZINGIBER, Willd. *Ed. Dub.* ZINGIBER OFFICINALE, Roscoe. *Lond.* Spr. *g.* 12. *sp.* 1.

Ginger.

Off.)—The dried root, the ginger of the shops.

AMOMI ZINGIBERIS RADIX. *Ed. Dub.* ZINGIBERIS RADIX. *Lond.*

THE plant which yields this valuable spicy root was separated from the genus *Amomum* by Mr Roscoe, and is now called *Zingiber officinale*, after him, by the late Dr Roxburgh, in his valuable Flora Indica, whose completion, by his able successor, Dr Wallich, is so anxiously expected by all botanists and pharmacologists. Although the ginger is cultivated in all parts of India, it rarely flowers; and Dr Roxburgh never saw the seeds. It is also cultivated in the West-India islands, very much in the same manner as potatoes. The root is fit for digging once a-year, unless for preserving in syrup, when it should be dug at the end of three or four months, at which time it is tender and full of sap.

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* *Syn.* Gingembre, Amome des Indes, (*Fr.*) Ingwer, (*Ger.*) Zenzero, Zinzibo, (*It.*) Sookoo, (*Tam.*) Sont, (*Duk.* and *Hind.*) Inghuroo, (*Cyng.*) Alia, (*Malay.*) Jai-aking, (*Jav.*) Jahetuh, (*Bali.*) Sonti, (*Tel.*) Wooraka, (*Ternat.*) Gora, (*Tidor.*) Siwe, (*Arab.*) Sohi, (*Band.*) Sunthi, (*Sansc.*)

In the shops, it occurs in fragments of an inch and more in length, knotty, tuberous, flattened, subpalmate, obtusely lobated or mammilated, with a thin epidermis of a pale yellowish grey colour, unequally rugose and plaited; brownish yellow bark; whitish fleshy parenchyme, in the dry state subfarinaceous; medulla whitish yellow, heavy, compact, traversed by hair-like fibres, with an agreeable camphoraceous odour, particularly fragrant in the recent root, and an aromatic very acrid taste, biting the fauces.

There are two varieties of commercial ginger; the black and the white. The black, previous to its rapid exsiccation, is immersed in boiling water, to prevent its germination, and hence acquires a horny texture; the white is peeled when fresh, and dried by insolation; and as it is necessary to select the fairest and roundest roots for exposure to the sun, white ginger is commonly one-third dearer than black. It is firm and resinous, and more pungent than the black. Pieces which are worm-eaten, light, friable, or soft, and very fibrous, are to be rejected.

In the colonies they pickle it in vinegar; they also make a preserve of it with sugar, which has an agreeable odour, a spicy taste, and keeps well. Preserved ginger should be prepared in India from the young and succulent roots. When genuine, it is translucent and tender. That manufactured in Europe is opaque and fibrous.

Ginger root was analysed, in 1817, by Bucholz, and in 1823, by M. Morin. Their results agree as nearly as could be expected from their different modes of procedure.

M. Morin acted upon the root first with alcohol of 0.827, and from the tincture, he got by distillation, and subjecting the residuum successively to the action of water, ether, and solution of potass, a volatile oil of greenish blue colour, a little extract like osmazome, acetate of potass, and acetic acid, a soft brownish yellow resin, acrid, aromatic, and soluble in ether and alcohol, and a sub-resin insoluble in ether. From the remainder of the root, by the action of cold water, first by maceration, and then by beating and bruising, he got gummy matter, animo-vegetable matter, osmazome? sulphur, starch, and lignine. The fibre burnt yielded carbonate and muriate of potass, with traces of other salts.

M. Bucholz used *boiling* water after the principles soluble in alcohol were removed, by which some of the principles, as the starch, would be altered; but his results were, from 1000 grains, oil 15.6, soft resin 36, extractive 111.5, gummy extractive 260, gum 120.5, starch 197.5, tragacanthine 83, lignine 80, moisture 119 = 1023.1.

M. Planche also obtained from ginger a considerable quantity of starch as pure and as white as that of wheat. This is conformable to the chemical composition of the scitamineous roots, from several of which starch is extracted in great quantities as a popular aliment, especially from various species of *Curcuma*, as the *rubescens*, from the pendulous tubers of which the natives prepare a very beautiful pure starch, which is said to form a large portion of the diet of the inhabitants of Travancore; the *leucorrhiza*, a native of Bahar, and the *comosa*, a native of Burma.

Med. use.—Ginger is much used in India as a condiment for sauces, soups, and made dishes in general. It is a very useful spice in cold flatulent colics, and in laxity and debility of the intestines; it does not heat so much as the peppers, but its effects are more durable. Lately, the powder of ginger, taken in very large doses in milk, acquired the reputation of being almost specific in the gout. It may also be applied externally as a rubefacient. In pharmacy it is much employed as a corrective of the griping effects of drastic purgatives.

Dose.—Ten grains to a scruple or upwards of the powder may be taken in any mucilaginous liquid.

Off. Prep.—Syrupus zingiberis, *L. D.* Syn. amomi zing. *E.* Tinctura zingiberis, *L. D.* Tinct. amomi zing. *E.* Confectio opii, *D. L.* Pulvis aromaticus, *D. E.* Pulvis scammonii comp. *D. L.* Pilulæ gambogiæ comp. *D. L.* Pilulæ scillæ comp. *D. L.* Electuarium scammonii, *D.* Confectio scammoniæ, *L.* Infusum sennæ comp. *D. L.* Acidum sulphuricum aromaticum, *D. E.*

Sp. 7. AMOMUM CARDAMOMUM *. *Dub.* *Sp.* 10. AMOMUM REPENS. *Ed.* MATONIA CARDAMOMUM. *Lond.* Smith *in* Rees' *Cyclopedia.*

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* *Syn.* Amomum repens, (*Sonnerat, Woodville, Roscoe, Willd.*) Elettaria, (*Rheede, Hort. Malab.*) Petit cardamome, (*Fr.*) Kleine Kardamomen, (*Ger.*) Cardamome minore, (*It.*) Yaydorsie, (*Tam.*) Yaylakooloo, (*Tel.*) Ensal, (*Cyng.*) Ebil, (*Arab.*) Kakeléh séghār, (*Pers.*) Capalaga, (*Malay, San.*) Eelāchie, (*Duk.*) Elettari, (*Rheed.*) Kapol, (*Jav.*) Gujarati elachi, (*Hind.*) Heelbuya, (*Arab.*)

Lesser Cardamom.

Off.—Lesser cardamom seeds.

AMOMI REPENTIS SEMEN. *Ed.* CARDAMOMI SEMINA. *Lond.* AMOMI CARDAMOMI SEMINA. *Dub.*

The confusion, which at present subsists in regard to the shrub producing this spicy seed, it is to be hoped, is now likely to cease, since the publication of Dr Roxburgh's classical *Flora Indica*, in which it is referred to the *Alpinia Cardamomum, g.* 15. *sp.* 1. He has been already followed by Sprengel and the Berlin Pharmacopœia. The names given by the London and Edinburgh Colleges are synonimes of the true plant; but the *Amomum Cardamomum* of the Dublin furnishes a spurious, and not the true, cardamom.

The notes to Dr Roxburgh's botanical description contains some curious information on the subject. The plant is a native of the mountainous part of the coast of Malabar. The root is tuberous, and the stem perennial. The capsules are oval, size of a small nutmeg, three celled, three sided; the seeds many and angular.

The seeds, it is asserted, never germinate, and the plant is propagated only by cuttings, or in the following manner. Before the commencement of the periodical rains, the cultivators of the cardamom ascend the coldest and most shady side of a woody mountain. A tree of uncommon size and weight is there sought after, the adjacent ground is cleared of weeds, and the tree felled close at the root. In about a month's time young cardamom plants appear. The natives attribute no other effect to the fallen tree, which may be selected from any species, than such as are derived from its weight and strength, added to the shade, which its branches afford to the young plant. The shrub continues to grow in this manner until nearly after the early rain of the fourth year in February, when it has reached its utmost height, which varies from 6 to 9 feet. Four or five tendrils, called the threads, now spring from its stem, near the root, and afterwards the fruit is produced, which is gathered in November, and dried in the sun. The fruit is annually collected until the seventh year, when it is usual to cut the plant down, and from the trunk, sprouts arise in the next monsoon, which grow, flourish, and are cultivated as before. This article yields to the Indian government from 25 to 30,000 rupees *per annum*.

The seeds themselves are small, almost black, nearly triangular, rugose, with an intensely aromatic taste, and a fragrant camphoraceous smell, and are contained in a triangular membranaceous capsule, pointed at both ends, about half an inch long and trilocular. From 480 parts Neumann got about 20 of volatile oil, 15 of resinous, and 45 of watery extract. The capsules, which have very little smell or taste, may be easily separated, by beating them in a mortar, when the seeds will readily pulverize, so as to be freed from the husk by the sieve: this should not be done till just before using them; for if kept without the capsules, they soon lose considerably of their flavour.

Med. use.—Cardamom seeds are an article of great importance in India. The inhabitants use them as a general condiment to their food, and they are likewise held in sacred estimation for the purpose of their sacrifices. They are constantly chewed with betle; and some medicinal properties are ascribed to them, when used in decoction, for complaints of the bowels.

Cardamom seeds are very warm, grateful, pungent, aromatic, and frequently employed as such in practice. They are however chiefly used as a corrective in compound medicines.

Off. Prep.—Tinctura cardamomi, *L.* Tinct. amomi repentis, *E.* Tinct. card. comp. *L. D.* Tinct. cinnamomi comp. *L. E.* Tinct. gentianæ comp. *L. D.* Tinct. rhei, *L. E.* Tinct. rhei comp. *D.* Tinct. rhei cum aloe, *D.* Tinct. sennæ, *L. E.* Tinct. sennæ comp. *D.* Tinct. conii, *D.* Spiritus ætheris aromaticus, *L.* Vinum aloes socotorinæ, *E.* Confectio aromatica, *L. D.* Pulv. cinnamomi comp. *L.* Pulvis aromaticus, *D. E.* Pilulæ scillæ maritimæ, *E.* Inf. sennæ cum tamarindis, *D.* Extractum colocynthidis comp. *L. D.*

AMYGDALUS *. *Ed. Dub. Lond.*

Wild. *g.* 981; Spr. 1815. *Icosandria Monogynia.*—Nat. ord. *Pomaceæ*, Linn., *Rosaceæ*, sect. *Drupaceæ*, Juss.

Sp. 2. AMYGDALUS COMMUNIS. *Ed. Dub. var.* β, *and* γ, *Lond.* The almond tree.

Off. a)—The kernel; sweet almonds.

AMYGDALI COMMUNIS NUCLEI. Amygdalæ dulces ex varietate sativa. *Ed.* AMYGDALÆ DULCES. *Dub. Lond. var.* β.

b) The kernel; bitter almonds. AMYGDALÆ AMARÆ. *Lond. var.* γ.

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* *Syn.* Amandes douces, (*Fr.*) Süsse Mandeln, (*Ger.*) Mandole dolce, (*It.*) Amandes ameres, (*Fr.*) Bittre Mandeln, (*Ger.*) Mandole amare, (*It.*)

I know not to which variety the eastern synonimes of Dr Ainslie belong. Parsie Vadomcottay, (*Tam.*) Waloo Looway, (*Cyng.*) Inghoordi, (*Sansc.*) Parsie Vadomvittooloo, (*Tel.*) Badamie Farsie, (*Pers. Duk. and Hind.*) Louz, (*Arab.*) Lowzan, (*Malay.*) Kateping, (*Java.*) Kataping, *Bali.*)

The almond tree nearly resembles the peach. It originally came from Syria and Barbary, but is now much cultivated in the south of Europe, and even naturalised in some places. There is no apparent difference between the trees which produce the sweet and bitter almonds; and it is even said, but without probability, that the same tree has, by a difference in culture, afforded both.

Almonds are sometimes imported in the shell. Twelve of these weighed 510 grains, and contained fifteen kernels, which weighed 200 grains, so that more than half the weight consists of useless shells. But in pharmacology, shelled almonds alone are used. These in general have an oblong compressed shape, are covered with a yellow-brown longitudinally wrinkled and powdery pellicle, and internally have a white parenchyme, with a short shining fracture. The sweet almonds have no smell, and their taste is nutty. The bitter almonds have the ratafia smell, and a bitter nutty taste. It is stated in most treatises on pharmacology, that by their external appearance the sweet and bitter almonds cannot be distinguished. This is a mistake. A grocer would be very ignorant who could not distinguish them at first sight, or even blindfold. Bitter almonds, besides being more various in shape, are only about half the size of the others, 120 being required to weigh 1000 grs.; whereas, of Valentia almonds, 75, and of Jordans, 54 are enough. The Jordan are the finest, and are easily known by their greater length; the Valentia are broader and flatter.

M. Boullay has given an analysis of the sweet almond, and M. Vogel of the bitter almond. False ideas long prevailed concerning the chemical constitution of the emulsive seeds. Thus Fourcroy, in his great work, says expressly, that all dicotyledonous seeds which contain oil also abound with mucilage and fecula. The first hint of their true constitution was given by Proust. Boullay next observed, in his analysis of the berries of the *Menispermum cocculus*, that although emulsive, they contained neither mucilage nor amylaceous fecula; and that, in regard to almonds, he had ascertained the inaccuracy of Fourcroy's assertion. In 1817 he published a detailed analysis of the sweet almond. He shewed that they contain no starch, and that 100 parts are composed of fixed oil 54, albumen 24, liquid sugar 6, gum 3, fibre 4, pellicles 5, water 3.5, loss and acetic acid 0.5. The analogy of almond emulsion with animal milk is so strong, that almonds may almost be considered as concrete milk. The chief difference observable is, that the albumen of almond emulsion coagulates by heat alone, without the addition of acid or rennet, which the caseum of milk requires.

About the same time Vogel of Munich was engaged in analyzing the bitter almond. The result was read to the Royal Academy of Munich in 1814, and coincided with that of M. Boullay. He found that other emulsive seeds had the same composition, viz. cucumber, melon, hemp, white poppy, pistachio nut, filbert and walnut. The bitter almond differed, however, essentially from the sweet almond, in containing Prussic acid, previously detected in it by Bohm and Schrader, and volatile oil. He observed that the volatile oil could be obtained separate from the prussic acid. It was very acrid, very bitter, heavier than water, and composed of two distinct kinds of oil; 2000 to 3000 yielded four parts of it. When dissolved in water it imparted the taste and smell of prussic acid without the property of furnishing Prussian blue; and when rectified over baryta, lime, or red oxide of mercury, it lost its fluidity on the contact of air, and formed white crystals, almost inodorous, and much less volatile than the fluid oil.

M. Robiquet's paper on the volatile oil of bitter almonds is highly interesting in a physiological point of view. He obtained from the volatile oil of bitter almonds two oils, one of which crystallized by the contact of air and the absorption of oxygen, while the more volatile oil was incapable of crystallization. The crystals contain no azote as an element, but the uncrystallizable oil a notable quantity. This oil was also highly deleterious, while the crystals were perfectly inert. The oil of the *Prunus laurocerasus* was analogous in every respect. Prof. Lavini thinks, that prussic acid does not exist as such in the bitter almond; but its elements are there, and combine to form it under certain circumstances. Vogel also remarks, that a quantity of bitter almonds can be given in emulsion with impunity, which by distillation with water would destroy life, showing the new arrangement of the elements by the action of heat. He likewise observed, that the ratafia smell was stronger in expressed oil of bitter almonds when they were slightly heated before expression. From these observations it may be concluded that the fixed oil is not organically combined in the almond, but exists in isolated masses or particles like the fat and oil in animals, or the starch in vegetables; that the volatile oil is probably organically combined with the parenchyme, and that the fixed oil acquires the power of dissolving this organic combination in proportion to its increase of temperature.

It is a singular fact, that the seeds of two varieties of the same kernel should differ so essentially in their chemical composition; the bitter almonds containing a deleterious principle, which does not exist in the sweet variety, although found in its bark, leaves and flowers; while the sweet contains a muco-saccharine principle, wanting in the bitter.

The existence of *hydrocyanic* or *prussic acid*, as a vegetable principle, was discovered in 1802 by Bohm, in the distilled water of bitter almonds. By repeated cohobation of the same water with fresh quantities of bitter almonds, Von Ittner obtained from six pounds of almonds, one drachm and forty grains of volatile oil, and two pounds of very concentrated distilled water. Hydrocyanic acid was discovered in the leaves of the cherry laurel by Schrader, also in 1802; in peach blossoms and leaves by Vauquelin; in cherry water by Von Ittner, and in the bark of the bird cherry by John. In all these and many similar substances, the acid is modified by its intimate combination with a volatile oil.

The bland oil, called Almond oil, is obtained from bitter as well as sweet almonds by expression, if no heat be employed; but if heated, the oil expressed from bitter almonds is impregnated more or less with the narcotic volatile oil, as is readily manifested by its smell and taste.

Med. use.—Sweet almonds are of greater use in food than in medicine, but they are reckoned to afford little nourishment; and when eaten in substance, are not easy of digestion, unless thoroughly comminuted. They are supposed, on account of their unctuous quality, to soften acrimonious juices in the primæ viæ. Peeled sweet almonds, eaten six or eight at a time, sometimes give present relief in the heartburn.

On triturating almonds with water, the oil and water unite together, by the mediation of the albuminous matter of the kernel, and form a bland milky liquor, called an Emulsion, which may be given freely in acute or inflammatory disorders. As the bitter almond imparts its peculiar taste when treated in this way, the sweet almonds alone are employed in making emulsions.

Several unctuous and resinous substances, of themselves not miscible with water, may, by trituration with almonds, be easily mixed with it into the form of an emulsion; and are thus excellently fitted for medicinal use. In this form camphor, and the resinous purgatives, may be commodiously taken.

Almond oil is supposed to blunt acrimonious humours, and to soften and relax the solids: hence its use internally, in tickling coughs, heat of urine, pains and inflammations; and externally, in tensions and rigidity of particular parts.

The flour from which almond oil has been expressed is in common use as a cosmetic soap.

Bitter almonds have been found poisonous to dogs and smalleranimals. Nevertheless bitter almonds are every day used in cookery, on account of their agreeable flavour; but there are some habits, in which the smallest quantity produces urticaria, and other unpleasant symptoms. The medical use of bitter almonds is of a very ancient date. Bergius revived their administration in ague. He gave ʒſs.–ʒij. of extract of the lesser centaury, in an emulsion made of ʒij. or ʒiij. bitter almonds, with ℥iij. of water. Hufeland also asserts, that when eaten freely for several weeks tape worms were expelled, which had resisted every other remedy. In several of the foreign pharmacopœias there is a formula for water of bitter almonds, which in every respect coincides with cherry laurel water. The oil of bitter almonds, for the deleterious effects of which I must refer to my colleague Dr Christison's classical work on poisons, is very extensively used by compounders of liquors, for making artificial noyau and ratafia.

Off. Prep.—Amygd. dulces.—Oleum amygdalarum, *D. L.* Ol. amygd. communis, *E.* Confectio amygdal. *L. D.* Mistura amygdal. *D.* Emulsio amygd. comm. *E.* Emulsio Arabica, *D.* Emuls. acaciæ Arab. *E.* Emulsio camphoræ, *E.* *Amygd. amaræ.*—Mistura amygdalarum, *D.*

AMYGDALUS PERSICA *.

Off.—The leaves.
FOLIA.

PEACH LEAVES have been introduced into the officinal simples of Britain by the last edition of the Dublin Pharmacopœia. The peach tree is a native of Persia, from which it was early introduced into Europe. Its fruit is saccharine, and some of the varieties improved by the art of horticulture are highly esteemed. Excellent brandy is obtained from them in North America. The kernels in every respect resemble bitter almonds, and serve for the preparation of *liqueurs.* The flowers have the smell and taste of bitter almonds. They are mucilaginous, and a purgative syrup is prepared from them in some countries of the Continent. The leaves, which are now officinal, are said to be astringent, and to purge also. But this is not probable. It is more certain that they have the taste and smell of the bitter almonds, and contain the same narcotic principle. M. Gauthier de Saint Sauvin reports his having obtained a large proportion of oil from them by distillation. So far back as 1757, Dr Ungnad got 20 gr. of volatile oil from three pounds of fresh peach leaves in the beginning of June, but in July he obtained only a trace. Ittner scarcely procured a drachm from 24 pounds. An infusion of the leaves has lately been recommended in morbid irritability of the bladder and urethra. Half an ounce of the dried leaves are digested in one pound of boiling water for three hours, and of the infusion a table spoonful is given three times a-day.

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* *Syn.* Περικὴ μελέα, (*Græc.*) Persica mala, (*Latin.*) Le pecher, (*Fr.*) Pfirschenbaum, (*Germ.*) Persica, (*It.*) Khowkh, (*Arab.*) Shuftaloo, (*Pers.*)

AMYLUM [*]. *Lond. Ed.*

Starch from wheat flour.

WHEAT flour consists chiefly of starch, gluten, albumen, and a sweet mucilage. These may be easily separated by forming the flour into a paste with a little water, and washing this paste with fresh quantities of water until it runs from it colourless. What remains is the gluten, which, if not the same with, is very analogous to, the fibrine of animal substances. From the water with which the paste was washed, a white powder, *Amylum*, separates on standing. The albumen and sweet mucilage remain dissolved in the water. By evaporating it, the albumen first separates in white flakes, and the sweet mucilage may be got by total evaporation.

Starch is a fine white powder, generally concreted in friable hexagonal columns, smooth to the feel, and emitting a particular sound when compressed. It has neither taste nor smell. It is decomposed by heat. It is not soluble in cold water or in alcohol. Warm water about 190° F. converts it into a kind of mucilage, which on cooling assumes a gelatinous consistence. This jelly, when dried by heat, becomes transparent and brittle like gum, but is not soluble in cold water. Starch, after being thus dissolved in hot water, cannot be reduced to its original state. It is precipitated by infusion of galls, and the precipitate is redissolved on heating the mixture to 120°, but is not soluble in alcohol. It is the most delicate test of iodine, forming with it a fine blue or violet colour. At 78 F. its watery solution ferments with the addition of yeast. By roasting it becomes soluble in cold water, and it is converted by three or four hours' boiling with sulphuric acid into a saccharine liquid.

It is found in many vegetables combined with different substances: 1. With gluten or fibrine; as in wheat, rye, and other similar seeds. 2. With extractive; as in beans, peas, lupins, &c. 3. With mucilaginous matter; as in the potatoe, and many other roots, in unripe corn. 4. With saccharine matter in beet root, and in corn after it has begun to germinate. 5. With an acrid principle; as in the root of the burdock, jatropha manihot, arum and asarum.

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[*] *Syn.* Amidon, (*Fr.*) Stärkemehl, (*Ger.*) Amido, (*It.*)

After the discovery of the characteristic property which starch possesses of being coloured blue by iodine, M. Robert applied this test to a variety of roots. Besides those roots which are well known to contain starch, he found it in *Pœonia officinalis*, (Ranunc.) *Colomba*, (Menisperm.) *Althæa off.*, *Malva sylv.* (Malv.) *Trapæolum majus*, (Geran.) *Brassica Napus*, *Cochlearia Armoracia*, (Crucifer.) *Nymphæa alba*, (Nymph.) *Glycyrrhiza glabra*, *Ononis spinosa*, (Legumin.) *Geum urbanum*, *Fragaria vesca*, (Rosac.) *Apium Petroselinum*, *Daucus Carota*, (Umbellif.) *Callicocca Ipecacuanha*, (Rubiac.) *Valeriana off.*, (Valerian.) *Convolvulus Jalapa*, *C. Turpethum*, (Convolv.) *Atropa Belladonna*, *Solanum tuberosum*, (Solan.) *Rheum palmatum*, *R. Rhaponticum*, *Rumex acetosa*, *R. Patientia*, (Polygon.) *Laurus Sassafras*, (Laurin.) *Aristolochia Clematitis*, *A. Serpentaria*, (Aristoloch.) *Urtica dioica*, *Humulus Lupulus*, (Urtic.) *Arum maculatum*, (Aroid.) *Galanga minor*, *Amomum Zingiber*, *A. Zedoaria*, (Drymyrrh.) *Iris Germanica*, *I. nostras*, (Irideæ.) *Smilax Sarsaparilla*, *S. China*, (Smilaceæ.) *Tulipa Gesneriana*, (Liliac.) *Veratrum album*, (Colchic.) *Acorus Calamus*, (Juncaceæ.) *Aspidium filix mas*, (Filices.) He could find no starch in the roots of *Sinapis nigra*, (Crucif.) *Angelica archangelica*, (Umbell.) *Cichoreum Intybus*, *Leontodon Taraxacum*, *Inula Helenium*, (Compos.) *Symphytum off.*, *Borago off.* (Borag.) *Allium Cepa*, *A. Porrum*, *Scilla maritima*, (Liliac.)

Starch is not absolutely identical as obtained from different vegetables. M. Caventou made some interesting observations on amylaceous substances. Wheat starch, their prototype, is totally insoluble in cold water; but from various causes it may be so modified as to become more or less soluble. Saussure described the effect produced in a mixture of starch and water left together to undergo the process of spontaneous decomposition. They formed a paste, which by analysis was found to contain sugar 47.4; gum 23; modified starch 8.9; starch 4, and amylaceous lignin 10.3 = 93.6. To the modified starch he gave the name of *Amidine.* But Caventou proved, that fermentation is not necessary to its production; for unfermented starch experiences the same modifications when it is boiled with water, or heated until it becomes of a pale brown colour, (British gum,) or treated with dilute sulphuric acid. The characters of amadine are, solubility in cold water, being precipitated by tincture of galls, and by acetate of lead, and not forming a jelly on cooling after being concentrated. The arrow-root *(Maranta arundinacea)* of the West Indies, and potatoe starch, in the preparation of which also no heat is employed, agree with raw wheat starch in all respects. But sago, *(Sagus farinifera,)* and tapioca *(Jatropha manihot,)* are not varieties of starch but of amidine. They must, however, have been extracted from the plants in the form of starch, as they are got by washing with cold water; but the modification is afterwards effected by the heat employed in the process of drying or by slight torrefaction. Salep *(Orchis mascula)* is not an amylaceous substance, but analogous to gum tragacanth, containing a large proportion of bassorine.

M. Villars of Strasbourgh published a very curious essay on the structure of the potatoe, as seen by the microscope. He found the starch (farine) of potatoes formed of ovoid globules from $\frac{1}{100}$ to $\frac{1}{30}$ of a line in diameter. Those of wheat starch were about one-third of the size, varying from $\frac{1}{250}$ to $\frac{1}{100}$. Those of potatoe were smooth, brilliant, and milky, like globules of mercury. When bruised upon a glass, they were reduced into square or irregular fragments, but still smooth. By boiling they were enlarged about a third, but seemed cracked on the surface. When viewed in a thin slice of frozen potatoe, they were seen disposed in contiguous groups in the meshes of a net-work of fibre, but not adhering to them. Wheat starch is less easily altered by heat than potatoe starch; it contains less water, which it parts with and recovers less readily. Therefore potatoe bread does not keep fresh above two or three days; wheat bread keeps from four to eight; and rye bread at least fifteen or twenty, or even a month, especially if the bran be not separated.

MM. Raspail and Dumas have since published some very remarkable microscopic observations on the structure and different forms and size of the varieties of fæcula.

M. Planche having observed the remarkable lightness of some starch prepared by him from the root of the black radish, conceived that a comparison of the weight of equal volumes might serve to distinguish the fæcula of different vegetables. According to him, the specific gravity of flour starch to potatoe starch was as 62 to 84; and this difference seemed not unimportant in Pharmacy, as the former serves admirably to suspend camphor, for which the latter is unfit.

This led MM. Payen and Chevallier to institute some experiments, from which it may be concluded, that the specific gravity of all starches is the same, 1530; and that the difference of the weight of the same volume, when dry, is owing to the particular minuteness of their grains.

In this country the finest starch is obtained from wheat flour, but it is also procured of very fine quality from the potatoe. In the West Indies what is called Arrow root, is prepared from the roots of the *Maranta arundinacea;* and a similar substance is got in the East Indies from various species of *Curcuma.* Other kinds of fæculæ are more or less altered by the process followed in preparing them. What is commonly sold as arrow root is nothing but potatoe starch. In fact, it is sold for less than genuine arrow root costs in the West Indies. Nor does any harm arise from the substitution; for, so far as my experiments go, I can find no chemical difference between them, although many modes of distinguishing the genuine from the spurious are from time to time published in periodical works.

Med. use.—As a constituent of many vegetable substances, starch forms a most important alimentary substance.

By ultimate analysis by means of fire, chemists have attempted to ascertain the proportion in which the various elementary principles enter into the composition of nutritious substances. Dr Prout has lately published an admirable paper, which greatly elucidates the action of alimentary and medicinal substances, especially the diversity of effects of analogous substances, and reconciles the observations of the vulgar and of practical men, with the recondite views of philosophic chemistry. Dr Prout is of opinion, that the principal alimentary matters employed by man, and the more perfect animals, may be divided into three classes, namely, the saccharine, the oily, and the albuminous. The last is characterized by the presence of nitrogen as a constituent; the second by hydrogen in excess; and the first by the oxygen and hydrogen entering into their composition in the proportions which constitute water. The term *saccharine* is therefore used in a very extended sense, and includes all amylaceous and gummy substances, as well as the varieties of sugar properly so called. It is nearly synonymous with vegetable aliment.

In commerce, imperfect sugars are called *low* sugars. Dr Prout has retained the epithet in the same sense, and has applied it also to the starches; thus pure sugar-candy is the highest, and sugar of honey the lowest well-defined sugar; wheat starch the highest, and arrow-root the lowest starch.

It has been long known, from the very infancy of chemistry, that all organized bodies, besides the elements of which they are essentially composed, contain minute quantities of different foreign bodies, such as earthy and alkaline salts, iron, &c. These have been usually considered as mere mechanical mixtures accidentally present; but Dr Prout is satisfied that they perform very important functions, and that organization cannot take place without them. He has used the word *merorganized* (or partly organized) to designate substances in this state as partly, or to a certain degree organized. In this sense starch is merorganized sugar, both having essentially the same composition; but the starch differing from the sugar in containing minute proportions of other matters preventing its constituent particles from arranging themselves in the crystalline form, and causing them to assume totally different sensible properties.

In a medical point of view, starch is to be considered as a demulcent; and accordingly, it forms the principal ingredient of an officinal lozenge, and a mucilage prepared from it often produces excellent effects, both taken by the mouth, and in the form of a clyster in dysentery, and diarrhœa from irritation of the intestines. Externally flour or starch is the usual application in erysipelatous affections of the skin; but upon what principle is not very apparent, unless it be an empirical practice remaining from the pathology which dreaded the repulsion of all external inflammations.

Incompatibles.—Alcohol, ethers, oils, volatile and fixed, vegetable astringents, iodine?

Off. Prep.—Mucilago amyli, *L. E. D.* Trochisci gummosi, *E.* Pulv. tragacanth. comp. *L.* Pilulæ hydrargyri, *E.*

AMYRIS.

Willd. *g.* 755; Spr. *g.* 1446.—*Octandria Monogynia.*—Nat. ord. *Dumosæ*, Linn., *Terbinthaceæ*, Juss.

Sp. 2. AMYRIS ELEMIFERA. *Lond. Dub.*

Elemi.

Off.—The resin called Elemi.

ELEMI *. Resina. *Lond. Dub.*

ELEMI was originally brought from Egypt or Ethiopia in masses of two or three pounds wrapped up in palm leaves. This kind is now rare. It is at present chiefly imported from the warm provinces of America in tin cases, in large masses. These are afterwards divided, and the pieces wrap-

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[*] *Syn.* La résine elemi, (*Fr.*) Œhlbaumharz, (*Ger.*) Elemi, (*It.*)

ped up in parchment, and are to be kept in a box. The pieces are amorphous, of a citrine or sulphur colour, diaphanous, porous or compact, fragile, with a kind of radiated fracture, fragments unequal, of a resino-vitreous lustre, becoming white on trituration, resinous to the touch, softening, and then becoming ductile by the heat of the hand; smell a mixture of lemon and camphor, or somewhat resembling fennel; of an analogous taste, leaving a lasting bitterness on the tongue; entirely soluble in alcohol, solution citrine. Pieces occur which seem to have been melted by heat. It has been analyzed by M. Bonastre, who found it to contain 60 parts of a transparent resin soluble in alcohol at 60°; 24 of a resinoid substance soluble in boiling alcohol, from which it was deposited on cooling, white and opaque, and incapable of forming a soap with caustic ley; 12.5 parts of volatile oil; 2 of bitter extractive, and 1.5 of acid and impurities.

The tree which furnishes this elemi grows in Carolina and Spanish America. It is now the Icica icicariba of De Candolle. In dry weather, and especially at full moon, incisions are made in the bark, from which a resinous juice flows, and is left to harden in the sun.

Dr Wright says, that on wounding the bursera gummifera, a thick milky liquor flows, which soon concretes into a resin exactly resembling the elemi of the shops.

Off. Prep.—Unguent. elemi, *D.* Ungt. elemi comp. *L.*

Sp. 15. AMYRIS ZEYLANICA RETZII.

A kind of elemi which comes from the East Indies is said to be the produce of this species. It occurs in longish round, or round pieces, or in cakes of from 2 to 4 pounds, covered with reeds or palm leaves, *elemi en roseaux.* It is of a whitish yellow colour verging into green, semitransparent, externally hard, internally tough and soft, has an agreeable fennel smell, and a balsamic spicy taste. By keeping, it becomes hard, brittle, and friable.

Elemi is sometimes sophisticated with genuine elemi, colophony, and turpentine, which is detected by the smell when rubbed or warmed, and by the absence of phosphorescence, when rubbed with a pointed instrument.

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Sp. 7. Spr. AMYRIS GILEADENSIS.

Off.—Balsam of Gilead. A liquid resin.

AMYRIS GILEADENSIS RESINA [*]. *Edin.*

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[*] *Syn.* Balsamodendrum, Opobalsamum et Balsamod. Gileadense, (*De C.*) Βαλσάμου δένδρον, (*Theoph.*) Βαλσάμου ἰουδαίκον, (*Dios.*) Baume de la Mecque, (*Fr.*) Mecka balsam, (*Ger.*) Balsamo della Mecca, (*It.*)

This substance, which has also had the name of Balsamum Judaicum, Syriacum, de Mecca, Opobalsamum, &c. is a resinous juice, obtained from an evergreen tree, growing spontaneously, particularly on the Asiatic side of the Red Sea, near Mecca. The true opobalsamum, according to Alpinus, is at first turbid and white, of a very strong pungent smell, like that of turpentine, but much sweeter; and of a bitter, acrid, astringent taste: upon being kept for some time, it becomes thin, limpid, of a greenish hue, then of a golden yellow, and at length of the colour of honey.

This balsam is in high esteem among the eastern nations, both as a medicine, and as an odoriferous unguent and cosmetic. But in Europe it is never obtained genuine; and as all the signs of its goodness are fallacious, it has been very rarely employed. Nor need we regret it; for any of the other resinous fluids, such as the balsam of Canada or Copaiba, will answer every purpose full as well.

The dried berries of this tree were formerly kept under the title of Carpo-balsamum, and the dried twigs under that of Xylo-balsamum. Although Willdenow has inserted the amyris opobalsamum as a distinct species, he thinks they are the same.

Sp. 6. Spr. AMYRIS KATAF.

THIS is now generally allowed to be the tree which yields the myrrh.

ANCHUSA TINCTORIA. *Ed.*

Willd. *g.* 277. *sp.* 17; *g.* 596. Spr. *Pentandria Monogynia.*—Nat. ord. *Asperifoliæ*, Linn., *Borragineæ*, Juss.

Alkanet, or false alkanet.

Off.—The root *.

ANCHUSÆ TINCTORIÆ RADIX. *Ed.*

BOTANISTS and pharmacologists have confounded together the *Anchusa tinctoria* and *Lithospermum officinale.* The alkanet root of commerce belongs to the former, which grows in the Grecian Peloponnesus and in Cyprus, and is the Αγχουσα of Dioscorides, according to Sibthorpe and Sprengel. It is chiefly imported by the way of Montpellier, and has been hence erroneously stated by authors to be a native of the south-west provinces of Europe, where the *Lithospermum tinctorium*, De Candolle, described as the *Anchusa tinctoria* by Linnæus and Willdenow, is actually found. The alkanet root produced in England is much inferior in colour to that brought from abroad. Sometimes the roots of the *Anchusa officinalis*, dyed with Brazil wood, are substituted for the alkanet. The deception is detected by the wood of the broken ends being coloured as well as the bark.

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* *Syn.* Orcanette, (*Fr.*) Alkanne, Orkanez wurzel, (*Ger.*) Arganetta, (*It.*)

Alkanet root varies in thickness from the size of a goose quill to that of the little finger, and consists of a whitish wood under a blood-red bark. It has little or no smell; when recent, it has a bitterish astringent taste, but when dried scarcely any. It has been analyzed by Dr John of Berlin. The colouring power resides in a peculiar substance, soluble in alcohol, ether and oils, and not soluble in water; distinguished from the resins by not being fusible, and not being precipitated by water from its solution in alcohol. The tincture by evaporation changes from carmine red to blue, and then to greenish, and the dry extract has an indigo blue colour. Acids heighten the red colour of the tincture, and alkalies change it to blue, which is restored to the original colour by acids. The bark yields only about 5.5 *per cent.* of this substance, which John calls *Pseudo-alcannine*, to distinguish it from the unexamined colouring matter of the real alkanet which is furnished by the Lawsonia inermis, a native of India, Syria and Egypt.

Its chief use is for colouring oils, ointments and plasters. As the colour is confined to the cortical part, the small roots are best, having proportionally more bark than the large.

ANETHUM.

Willd. *g.* 560; Smith. *g.* 151. *Pentandria Digynia.*—Nat. ord. *Umbellatæ*, Linn., *Umbelliferæ*, Juss.

THE genus Anethum has been abolished by Sprengel; the first of the officinal species having been referred by him to *Pastinaca*, *g.* 1080, *sp.* 6, *Anethum*, and the second to *Meum*, *g.* 1050, *sp.* 4, *Fœniculum.*

Willd. *sp.* 1. ANETHUM GRAVEOLENS. *Lond.*
Dill.

Off.—The seed *.

ANETHI SEMINA. *Lond.*

DILL is an annual umbelliferous plant, cultivated in gardens, as well for culinary as medical use. The seeds are of a pale yellowish colour, in shape nearly oval, convex on one side, and flat on the other. Their taste is moderately warm and pungent; their smell aromatic, but not of the most agreeable kind.

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* *Syn.* Aneth a odeur forte, (*Fr.*) Dill, (*Ger.*) Aneto, (*It.*)

Med. use.—The seeds are recommended as carminative in flatulent colics.

Willd. *sp.* 3; Smith, *sp.* 1. ANETHUM FŒNICULUM. *Ed. Lond. Dub.*

Sweet Fennel.

Off.—The seeds.

a) ANETHI FŒNICULI SEMINA. *Ed. Dub.* FŒNICULI SEMINA. *Lond.* [*].

THIS is a biennial plant, of which there are four varieties. One of these, the common fennel, is indigenous on chalky cliffs. The sweet fennel, the variety which is officinal, grows wild in Italy, but is also cultivated in our gardens. It is smaller in all its parts than the common, except the seeds, which are considerably larger.

The seeds are oblong, striated, greyish green, have an agreeable aromatic smell, and a moderately warm pungent taste; with a considerable degree of sweetness.

From 960 parts, Neumann obtained 20 of volatile oil, 84 resinous extract, 120 fixed oil, and 129 of a bitter extract.

Med. use.—Carminative.

Off. Prep.—Aqua fœniculi, *L. D.* Oleum fœniculi dulcis, *D.* Spiritus juniperi comp. *D. L.* Confectio piperis nigri, *D.* Decoctum chamæmeli comp. *D.*

ANGELICA ARCHANGELICA [†]. *Ed. Dub.*

Willd. *g.* 543. *g.* 1086; Spr. *sp.* 1; Smith, *g.* 138. *sp.* 1. —*Pentandria Digynia.*—Nat. ord. *Umbellatæ,* Linn. Juss.

Angelica.

Off.—The root.

a) ANGELICÆ ARCHANGELICÆ RADIX. *Ed.*

b) ANGELICÆ ARCHANGELICÆ SEMINA. *Dub.*

ANGELICA is a large biennial umbelliferous plant. It grows spontaneously on the banks of rivers in Lapland, Norway, Switzerland, the Pyrenees, and in Bohemia. Linnæus gives the preference to that of Lapland, when it has been collected in the spring, or at the end of autumn. The root, cultivated at Paris, and dried carefully, has been thought to resemble that brought from Bohemia. It has been found wild in England, but it is doubtful whether it be indigenous. For the use of our shops it is cultivated in gardens.

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[*] *Syn.* Fenouil, (*Fr.*) Fencchel, (*Ger.*) Finocchio, (*It.*) Perun siragum, (*Tam.*) Dewadooroo, (*Cyn.*) Pedda-gillakāra, (*Tel.*) Mădhŭikā, (*Sans.*) Sonf, (*Duk.*) Mayuri, (*Hind.*) Badeeyan, (*Pers.*) Razeenuj, (*Arab.*) Adas, (*Jav.*)

[†] *Syn.* Angelique, (*Fr.*) Engelwurzel, (*Ger.*) Angelica, (*It.*)

The root is fusiform, an inch and upwards in thickness, fibrous, with thick irregular rugose radicles, epidermis yellowish grey; parenchyme, when fresh, yellowish and fleshy, with the subcortical vessels disposed annularly, and exuding, on being divided, a glutinous, honey coloured juice, with a whitish medulla, radiated with dark striæ; when dry somewhat spongy, exhibiting shining points from the exsiccated juice; it has a penetrating agreeable aromatic waxy smell; and a taste at first sweetish, and afterwards aromatic and warm. The roots are lifted in spring. They are apt to grow mouldy, and to be preyed on by insects. Baumé says, that it is only the roots gathered in the spring that are subject to this inconvenience, and that when gathered in the autumn they keep good several years. *Angelica* root loses three-fourths of its weight on being dried. It was analyzed by John. Its constituents were colourless, very volatile, and strong smelling etherial oil; gum 100.5; inuline 12; bitter extractive 37.5; resin of an acrid taste 20; peculiar principle soluble only in potass 22; woody fibres with a small portion of the preceding principle 90; water or loss 18=300. Five hundred parts of good root of Paris growth yielded four of volatile oil. Sometimes the root of the *Angelica sylvestris* is substituted for this. The difference is easily discovered. The root of the *A. sylvestris* is perennial, many-headed, with a solid stock, whose length is much greater than its diameter; that of the *A. Archangelica* is biennial, never many-headed, stock cellular, and its length scarcely equal to its diameter. The virtues of the *sylvestris* are much weaker than those of the *Archangelica*.

Med. use.—Angelica is one of the most elegant aromatics of European growth. The root is used in the aromatic tincture. The candied stalks make an agreeable sweetmeat, which is frequently presented in deserts to promote digestion. It is chiefly to the volatile oil that it owes its very peculiar strong smell and taste, and which must exert considerable power on the living system. John suggests that a distilled water of *Angelica* should be made officinal, as there is certainly no other distilled water more strongly impregnated with volatile oil, or which affect the senses of smell and taste more powerfully.

Off. Prep.—Spiritus anisi comp. *D.*

ANGUSTURA CORTEX. *Dub.* See BONPLANDIA TRIFOLIATA.

ANISUM. *Dub. Lond.* See PIMPINELLA.

ANTHEMIS.

Willd. *g.* 1517; Spr. *g.* 2822; Smith, *g.* 376. *Syngenesia Polygamia Superflua.*—Nat. ord. *Compositæ Radiatæ* Linn., *Synanthereæ*, sect. *Corymbiferæ*, Juss.

Spr. *sp.* 36; Smith, *sp.* 1. ANTHEMIS NOBILIS. *Ed. Lond. Dub.*

Chamomile *.

Off.—The flowers.

ANTHEMIDIS NOBILIS FLORES. *Ed.* ANTHEMIDIS FLORES. Flores simplices. *Lond.* FLORES CHAMÆMELI. *Dub.*

ROMAN CHAMOMILE is a perennial plant, indigenous in the south of England, but cultivated in our gardens for the purposes of medicine. In France and Britain the double flowers, that is those in which by culture the radiant flowrets are multiplied, and the discoid almost supplanted, are preferred; but in Germany, and indeed in the Pharmacopœia of the London College, the preference is justly given to the latter as being more aromatic, and containing more volatile oil. The flowers have a penetrating aromatic, but ungrateful smell, and a very bitter aromatic taste. Their active constituents are bitter extractive and essential oil, with camphor and a small quantity of tannin. They yield on distillation a volatile oil of a blue colour, or sometimes slightly greenish. If the distillation is carried too far, what passes at last is yellow. The blue volatile oil of chamomile becomes yellow also at the end of a certain time. 4000 parts of Roman chamomile flowers yielded a little more than 20 of volatile oil. In another experiment, 500 parts yielded 4. Hayne distilled the same water, after the separation of the oil each time, from nine successive quantities of double chamomile flowers of twelve pounds each. The quantity of oil he got from each successive distillation was 360, 560, 550, 555, 600, 630, 660, 620, and 620 grains, or 10 oz. 5 dr. and 55 grains from 108 pounds of flowers. The oil was of a pale brownish yellow colour, verging to greenish. Neumann obtained from 480 parts, 180 of alcoholic extract, and afterwards 120 of watery; and reversing the procedure, 240 of watery, and 60 alcoholic.

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* *Syn.* Camomile Romaine, (*Fr.*) Römishe Kamille, (*Ger.*) Camomilla Romana, (*It.*) Chamarùdoo poo, (*Tam.*) Babonv ka phool, (*Duk.*) Edaklouirzie, (*Arab.*) Babvoneh gaw, (*Pers.*)

The difference of the taste and smell, the diversity of the oil and the absence of camphor, sufficiently show that the flowers of the feverfew *(Matricaria Chamomilla)* should not be substituted for the Roman chamomile. They are easily distinguished by the receptacle, which in the latter is paleaceous, and in the former naked.

Med. use.—Chamomile flowers are a very common and excellent remedy, which is often used with advantage in spasmodic diseases, in hysteria, in spasmodic and flatulent colics, in suppression of the menstrual discharge, in the vomiting of puerperal women, in the afterpains, in gout, in podagra, intermittents, and in typhus.

Chamomile is also capable of exciting vomiting, especially when given in warm infusion; and in this way it is often used to assist the action of other emetics.

Externally, chamomile flowers are applied as a discutient and emollient, in the form of glyster or embrocation, in colic, dysentery and strangulated hernia, &c.

Chamomile flowers are exhibited,

1. In substance, in the form of powder, or rather of electuary, in doses of from half a drachm to two drachms, either alone, or combined with Peruvian bark, as for the cure of intermittent fevers.

2. In infusion, in the form of tea. This may either be drunk warm, for promoting the action of emetics, or cold, as a stomachic.

3. In decoction or extract. These forms contain only the extractive, and therefore may be considered as simple bitters.

4. The essential oil may be obtained by distillation. This possesses the antispasmodic powers in a higher degree than the simple flowers, but, on the contrary, does not possess the virtues depending on the presence of the bitter extractive.

To the oil is to be ascribed their antispasmodic, carminative, cordial, and diaphoretic effects; to the extractive their influence in promoting digestion.

Off. Prep.—Infusum chamæmeli, *D.* Decoctum chamæmeli comp. *D.* Decoct. anthem. nobilis, *E.* Extractum florum chamæmeli, *D.* Extract. anth. nob. *E.* Decoct. malvæ comp. *L.* Oleum anthemidis, *L.*

Sp. 37. Anthemis pyrethrum [*]. *Ed. Lond. Dub.*

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[*] *Syn.* La pyrèthre, (*Fr.*) Der Bertram, (*Germ.*) Piretro pilatro, (*It.*) Πυρεθρον, (*Diosc.*) Akkárákārum, (*Tam.*) Akkaraputta, (*Cyng.*) Akkurkurha, (*Arab. & Duk.*).

Pellitory of Spain.
Off.—The root.

RADIX ANTHEMIDIS PYRETHRI. *Ed.* RADIX PYRETHRI. *Dub. Lond.*

ACCORDING to Hayne, the *Anacyclus officinarum* is the plant from which, in modern times, the officinal pellitory root is obtained. Its native country is unknown, but it is cultivated in Thuringia, and near Magdeburgh, for the supply of the druggists and apothecaries.

The root is annual; when dry it is some inches long, tough, fibrous, of the thickness of a goose quill, or a little thicker, externally grey, internally white. It has no sensible smell. Linnæus compared its flavour to that of the *Polygala;* certainly its taste is very peculiar, exciting a mixed sensation of coldness and acrimony, succeeded by a great flow of saliva and durable tremulous pulsations in the tongue and other soft parts which it touches, but in a less degree than arum root; the juice expressed from it has scarcely any acrimony, nor is the root itself so pungent when fresh, as after it has been dried. Its analysis by different chemists is somewhat discordant. Neumann obtained from 960 parts of the dry root only 40 of alcoholic extract, which was excessively pungent. Its acrimony, therefore, seemed to reside in a resin. Schönwaldt, on the other hand, by repeated cohobation, obtained a butyraceous fiery tasted oil, without smell. According to John, the immediate principles in pellitory root are inuline (insipid) 120; gum (almost tasteless) 60; extractive (bitterish) 35; substance soluble in alkaline ley along with the woody part of the vessels 75; soft resin (of a very burning acrid taste) 5; volatile oil (with a very acrid taste, but almost inodorous,) a small quantity; camphor? alkaline carbonate, phosphate, muriate, and sulphate; carbonate of lime; phosphate of lime; phosphate of iron = 295; water and loss 5 = 300. He even remarks that the quantity of inuline exceeds that found in the elecampane itself. M. Gautier observed, that by mere inspection of a longitudinal section of a pellitory root, a multitude of little vesicles may be seen. These contain its active principle. He analyzed it by subjecting it successively to the action of sulphuric ether, alcohol of 847 sp. gr. and water. His conclusion is, that it contained a trace of volatile oil; fixed oil 5; yellow colouring principle 14; gum 11; inuline 33; traces of muriate of lime; lignine 35, and loss 2 = 100. Its peculiar acrimony resided entirely in the fixed oil; which was extracted by the ether. It was reddish, strong smelled, insoluble in water, lighter than water, congealed by cooling, and became fluid by heat; formed with alkalies a soap, soluble in water and in alcohol, having an acrid burning taste, strongly exciting salivation, in the same manner as the root when chewed. After its extraction the root was almost insipid. Boullay, however, thinks that some of its properties have greater analogy with resin than with fixed oil. The inuline was deposited from the decoction on cooling.

Med. use.—The inhabitants of Asia, as well as the ancient Romans, ate pellitory root confected, and employed it for various economical purposes. It is also used to give pungency to vinegar. Its principal use is for promoting the salival flux, as a masticatory; by this means it often relieves the toothach, some kinds of pain in the head, and lethargic complaints. A saturated tincture is the nostrum of some dentists. A vinous infusion is also useful in paralytic debility of the tongue.

ANTIMONII SULPHURETUM *. *Ed. Dub. Lond.* Sulphuret of antimony.

ALTHOUGH sulphuretted antimony be a natural production, yet it is commonly sold in the form of loaves, which have been separated from the stony, and other impurities of the ore, by fusion, and a species of filtration. The ore is melted in conical well-baked earthen pots, having one or more small holes in their apices. The fire is applied round and above these pots; and as soon as the sulphuretted antimony melts, it drops through the holes into vessels placed beneath to receive it, while the stony and other impurities remain behind. As antimony is volatile, the mouths and joinings of the pots must be closed and luted. The upper part of the loaves thus obtained is more spongy, lighter and impure, than the lower, which is therefore always to be preferred. These loaves have a dark-grey colour externally, but on being broken they appear to be composed of radiated striæ, of a metallic lustre, having the colour of lead. The goodness of the loaves is estimated from their compactness and weight, from the largeness and distinctness of the striæ, and from their being entirely vaporizable by heat. Varieties of sulphuretted antimony, which naturally contain sulphuret of lead, are frequently met with, and prove hurtful to the processes to be performed with them. The texture of these is rather foliated than striated, and they are not vaporizable. The presence of manganese or iron is also known by their not being volatilized by a red heat.

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* *Syn.* Stibium, (*Lat.*) Στιμμι, (*Gr.*) Antimoine, sulfure d'antimoine, (*Fr.*) Spiésglanz, (*Ger.*) Antimonio, (*It.*) Anjema kalloo, (*Tam.*) Sūrmah, (*Pers. Duk. & Hind.*) Ismud, (*Arab.*) Lanjanum, (*Tel.*) Ungen, (*Hindooie.*) Sauvéra, (*Sans.*) Soormah, (*Mal.*)

M. Serullas, a very distinguished chemist, has published a very important paper on the existence of arsenic in the antimonial preparations used in medicine. According to him, antimony, even that which has undergone fusion five or six times repeated, its sulphuret, and all the antimonial preparations, with the exception of tartar emetic and the butter of antimony, contain arsenic. It follows from this, that it is from tartar emetic, or the butter, (chloride of antimony,) that it is proper to extract this metal for pharmaceutical uses. In order to prove the presence of arsenic, he takes the regulus and the sulphurets, brought to the state of the grey sulphuretted oxide by roasting, and exposes them with an equal weight of supertartrate of potass in a close crucible to a well-sustained fire for three hours. These alloys, on being brought into contact with water, are decomposed, and emit hydrogen gas, containing more or less of arsenic, which is made to deposit itself in the state of hydruret, by burning the gas in test-tubes. In this way an estimate may be made of the quantity of arsenic contained in the substance examined. From M. Serullas's observations it appears that tartar emetic, even when prepared from arseniated antimony, contains no arsenic. This he ascribes to its crystallization, which, as a means of absolute depuration, rejects the arsenic which remains in the mother water, as may be proved by the usual processes.

Med. use.—Formerly metallic antimony was given internally; but as its action depended entirely on the acid which it met with in the stomach, its effects were very uncertain and often violent. Cups were also made of antimony, which imparted to wine that stood in them, for some time, an emetic quality. But both these improper modes of exhibiting this metal are now laid aside.

Sulphuretted antimony was employed by the ancients, in collyria, against inflammations of the eyes, and for staining the eye-brows black. Its internal use does not seem to have been established till towards the end of the fifteenth century; and even at that time it was by many looked upon as poisonous. Experience has now, however, fully evinced, that it may be administered with perfect safety, and that some of its preparations are medicines of great efficacy.

The first decree of the Parliament of Paris against antimony was in 1566. The prejudice against it was for a time so strong, that an able Parisian physician, Paulmier, was expelled from the faculty in 1609 for having employed it. But by a revolution of opinion, not unusual in our profession, it was admitted by the faculty into the *Antidotarium*, published in 1637. It was much employed about 1650; but Guy Patin and some others considered it as a poison, and entitled a large register, *Martyrologe de l'Antimoine.* During this dispute the doctors of the faculty assembled on the 9th March 1666 to decide the point; on which occasion ninety-two voted for the admission of antimonial wine, and the Parliament authorised it by a decree of 10th April 1666.

The general effects of antimonials are, in small doses, diaphoresis, nausea; in large doses, full vomiting and purging. Some allege that antimonials are of most use in fevers when they do not produce any sensible evacuation, as is said to be the case sometimes with James's powder. They therefore prefer it in typhus, and emetic tartar in synochus, in which there is the appearance at first of more activity in the system, and more apparent cause for evacuation.

Off. Prep.—Antimony is exhibited,

I. In its metallic state,
    Combined with sulphur.
        Sulphuretum antimonii. *E. D. L.*
        ——————— præparatum. *E. D.*
II. Oxidized.
    a. Protoxide combined with sulphur,
        1. Sulphuretum antimonii præcipitatum. *E. L.*
            Sulphur antimoniatum fuscum. *D.*
        2. Antimonii vitrum. *L.*
    b. Protoxide combined with muriatic acid,
        Antimonii oxidum nitro-muriaticum. *D.*
    c. Protoxide combined with tartaric acid and potass,
        Tartras antimonii. *E.*
        Antimonium tartarisatum. *L.*
        Antimonii et potassæ tartras. *D.*
        Dissolved in wine, Vinum tartratis antimonii. *E.*
        Dissolved in diluted alcohol, Vinum antimonii tartarisati. *L.*
    d. Protoxide combined with phosphate of lime,
        Oxidum antimonii cum phosphate calcis. *E.*
        Pulvis antimonialis. *L. D.*

In estimating the comparative value of the preparations of antimony, we may attend to the following observations. All the metallic preparations are uncertain, as it entirely depends on the state of the stomach, whether they act at all, or operate with dangerous violence. The sulphuret is exposed, though in a less degree, to the same objections.

The preparations in which antimony is in the state of peroxide, are perfectly insoluble in any vegetable or animal acid, and are also found to be inert when taken into the stomach.

The remaining preparations of antimony, or those in which it is in the state of protoxide, are readily soluble in the juices of the stomach, and act in very minute doses. Of its saline preparations, only those can be used internally which contain a vegetable acid; for its soluble combinations with the simple acids are very acrid and corrosive. In general, the surest and best preparations of antimony are those which contain a known quantity of the metal in the state of protoxide.

Antimonii vitrum, s. s. Antimonii oxydum sulphuratum vitrificatum. *Lond.*

The sulphuretted oxide of antimony vitrified, commonly called Glass of Antimony.

The glass of antimony, which in the older editions of our Pharmacopœias was among the officinal preparations, and then rejected altogether, is now restored by the London College 1824, but inserted among the materia medica, as an article to be purchased, not prepared. The manner of preparing it was thus set down in the Edinburgh Pharmacopœia 1805:

Strew sulphuret of antimony, beat into a coarse powder, like sand, upon a shallow, unglazed, earthen vessel, and apply a gentle heat underneath, that the antimony may be heated slowly: stirring it, at the same time, continually, to prevent it from running into lumps. White vapours, of a sulphureous smell, will arise from it. When they cease with the degree of heat first applied, increase the fire a little, so that vapours may again arise; go on in this manner, till the powder, when brought to a red heat, exhales no more vapour. Melt this powder in a crucible, with an intense heat, till it assumes the appearance of melted glass; then pour it out on a heated brass plate.

In the first part of this process great part of the sulphur is driven off, while the antimony is converted into protoxide. In this state it was formerly called Antimonial Ash, *Cinis Antimonii.* In the second part this ash is melted. Mr Phillips seems to consider the presence of silex derived from the crucible as necessary for the vitrification, and in fact the glass of antimony always contains a notable proportion of silex, generally more than 5 *per cent.*

When properly prepared, it is in thin plates broken into fragments, having a metallic steel grey lustre, but tolerably transparent, and of a garnet, hyacinthine or orange red viewed by transmitted light. It is hard and rings, and is brittle, easily reduced to a brown powder. It is insoluble in water, but soluble in acids and in cream of tartar; the weak acids leaving red flocculi, like *Kermes mineral*, undissolved.

It may be impure from containing too much silica or oxide of iron; and glass of lead may be sold for it. But it is known to be good, if it be capable of being dissolved, with the exception of a few red flocculi, when digested in strong muriatic acid. An excess of silica is known by a gelatinous or sandy residuum; of iron by the dark colour of the solution, and its precipitation by the ferroprussiate of potass; and lead is detected by its forming shining crystalline flakes, which, when dissolved in distilled water, give a white precipitate with sulphuric acid. The substitution of glass of lead is detected when it is boiled in a solution of cream of tartar, in order to make tartar emetic; by scarcely any of it being dissolved, and by its being soon rendered black, according to Mr Phillips.

Med. use.—Glass of animony is a very active preparation of antimony, but unequal in its effects, and therefore unfit for internal exhibition.

Off. Prep.—Antimonium tartarizatum, *L.*

AQUA.
Water.

WATER does not enter the list of materia medica of any of the Colleges; but it is so important an agent, both in the cure of diseases, and in the practice of pharmacy, that a brief account of its varieties and properties can scarcely be considered as superfluous.

Water consists of 1 part of hydrogen combined with 8 parts of oxygen by weight, and is formed by the combination of two volumes of hydrogen with one of oxygen. Water is transparent, colourless, inodorous, and insipid. As water is assumed as the standard, or unity, in all tables of specific gravity of fluids and solids, it is necessary to know that a cubic inch of water weighs, at 30 inches barometer, and 62° Fahr., 252.458 grains, or very nearly 252.5 grains at 60°, according to the Dublin Pharmacopœia. Its greatest density is at 39.5, and in this state it is used as the unity in some foreign tables of specific gravity. At 32° Fahr. it exists in a solid form, and is crystallized. At 212° it expands to 1696 times its bulk, and is converted into a very elastic transparent and colourless vapour. Water absorbs small quantities of the simple gases, especially oxygen. It dissolves several of the salifiable bases, and in some degree all saline bodies, and is essential to the crystallization of most of them. It is composed and decomposed in many instances, and its chemical agency is almost universal.

Water should be perfectly transparent, and have neither smell nor taste, but it is never found perfectly pure; and sometimes it is unfit for internal use. *Atmospheric water* comprehends snow and rain water. When collected in the open fields, it is the purest natural water: that which falls in towns, or is collected from the roofs of houses, is contaminated with soot, animal effluvia, and other impurities, although after it has rained for some time, the quantity of these diminishes so much, that Morveau says it may be rendered almost perfectly pure by means of a little barytic water, and exposure to the atmosphere. *Snow water* is supposed to be unwholesome, but it is not very apparent upon what principle. Atmospheric water, after it falls, either remains on the surface of the earth, or penetrates through it until it meet with some impenetrable obstruction to its progress, when it bursts out at some lower part, forming a spring or well. The water on the surface of the earth, either descends along its declivities in streams, which gradually wearing channels for themselves, combine to form rivers, and at last reach the sea; or remain stagnant in cavities of considerable depth, forming lakes or ponds, or on nearly level ground, forming marshes.

The varieties of *spring water* are exceedingly numerous; but they may be divided into the soft, which are sufficiently pure to dissolve soap, and to answer the purposes of pure water in general; the hard, which contain earthy salts and decompose soap, and are unfit for many purposes, both in domestic economy and in manufactures; and the saline, which are strongly impregnated with soluble salts. When spring waters possess any peculiar character, they are called mineral waters. The purest springs are those which occur in primitive rocks, or in beds of gravel, or filter through siliceous strata. In general, large springs are purer than small ones. *Wells* are in fact artificial springs, and are more impure, as the soil which forms their filter contains more soluble matter; but as the soluble particles are gradually washed away, old wells contain finer water than new ones. *River water* is in general soft. It consists of spring water, which by exposure becomes more pure, and of running surface water, which, although turbid, from particles of clay suspended in it, is otherwise very pure. It is purest when it runs over a rocky soil, and its course is rapid, and it is well adapted for the brewing of malt liquor, and other purposes which require great solvent power. *Lake water* is similar to river water. *Marsh water*, on the contrary, is exceedingly impure, and often highly fetid, from the great proportion of animal and vegetable matters which are constantly decaying in shallow stagnant waters.

Mineral waters derive their peculiarity of character, in general, either from containing carbonic acid, or soda, not neutralized, sulphuretted hydrogen, purging salts, earthy salts, or iron; or from their temperature exceeding that of the atmosphere. The following are the most celebrated.

- *a.* Warm springs.—Bath, Bristol, Buxton, Matlock, in England. Barege, Vichy, &c. in France. Aix-la-Chapelle, Borset, Baden, Carlsbad, and Toeplitz in Germany; and Pisa, Lucca, Baia, and many others, in Italy.
- *b.* Carbonated springs.—Pyrmont, Seltzer, Spa, Cheltenham, Scarborough.
- *c.* Alkaline.—Carlsbad, Aix-la-Chapelle, Barege, Toeplitz.
- *d.* Sulphureous.—Enghien, Lu, Aix-la-Chapelle, Kilburn, Harrowgate, Moffat, and many in Italy.
- *e.* Purging.—Sea water, Lemington Priors, Harrowgate, Lu, Carlsbad, Moffat, Pitcaithly, Toeplitz, Epsom, Seidlitz, Kilburn, and all brackish waters.
- *f.* Calcareous.—Matlock, Buxton, and all hard waters.
- *g.* Chalybeate.—Hartfell near Moffat, Peterhead, Denmark, Cheltenham, Pyrmont, Spa, Tunbridge, Bath, Scarborough, Vichy, Carlsbad, Lemington Priors.

In the early editions of this Dispensatory, I gave a table of the contents of some of the mineral waters which had been most accurately analyzed, but I afterwards omitted it as being incomplete and unsatisfactory. Whole volumes have been written on the subject; and the difference in the analysis of each water by different chemists is so great, that it is not easy to reconcile them. This arises partly from the mode of analysis, which determines the acids and alkalis to unite differently. Indeed, it is doubtful whether in the water itself there exists any secondary compounds, or whether the whole bases and acids form one saline compound, and therefore it appears to me to be better to indicate the quantity of each acid and base by itself, and not as combined into neutral salt. M. Döbereiner has endeavoured to shew, that the saline ingredients of mineral waters exist in determinate proportions according to the atomic doctrine; and his doctrine would be very convenient, as enabling us to select amongst the variety of discrepant analyses. It is singular that mineral waters of an opposite nature, especially sulphureous and chalybeate, almost always exist in the neighbourhood of each other. This, Professor Reuss thinks, depends upon a subterranean galvanic action, by which the negative and positive electric principles are separated by polarity.

Med. use.—Water is an essential constituent in the organization of all living bodies; and as it is continually expended during the process of life, that waste must be also continually supplied. Indeed this supply is of such importance, that it is not left to reason or to chance, but forms the object of an imperious appetite. When taken into the stomach, water acts by its temperature, its bulk, and the quantity absorbed by the lacteals. Water about 60° gives no sensation of heat or cold; between 60° and 45° it gives a sensation of cold, followed by a glow and increase of appetite and vigour; below 45° the sensation of cold is permanent and unpleasant, and it acts as an astringent and sedative; above 60° it excites nausea and vomiting, probably by partially relaxing the fibres of the stomach, for, when mixed with stimulating substances, it has not these effects. In the stomach and in the intestines it acts also by its bulk, producing the effects arising from the distention of these organs; and as the intestinal gases consist of hydrogen gas, either pure or carburetted, sulphuretted or phosphuretted, it is probably in part decomposed in them. It likewise dilutes the contents of the stomach and intestines, thus often diminishing their acrimony. It is absorbed by the lacteals, dilutes the chyle and the blood, increases their fluidity, lessens their acrimony, and produces *plethora ad molem.* Its effects in producing plethora and fluidity of the blood are however very transitory, as it at the same time increases the secretion by the skin and kidneys. Indeed, the effects of sudorifics and diuretics depend, in a great measure, on the quantity of water taken along with them.

Mineral waters have also a specific action depending on the foreign substances which they contain. It is however necessary to remark, that their effects are in general much greater than might be expected from the strength of their impregnations, owing, probably, to the very circumstance of their great dilution, by which every particle is presented in a state of activity, while the lacteals admit them more readily than they would in a less diluted state.

Carbonic acid gas gives to the waters which are strongly impregnated with it a sparkling appearance, and an agreeable degree of pungency. In its effects on the body it is decidedly stimulant, and even capable of producing a certain degree of transient intoxication. It is of great service in bilious complaints, atony of the stomach, nausea, and vomiting, and in all fevers of the typhoid type.

Alkaline waters produce also a tonic effect on the stomach, but they are less grateful. They are particularly serviceable in morbid acidity of the stomach, and in diseases of the urinary organs. Alkaline waters are often supersaturated with carbonic acid, which renders them more grateful and stimulating in the first instance, but ultimately they act as alkalies.

Sulphureous waters are chiefly used in cutaneous and glandular diseases. Their effects are stimulant and heating, and they operate by the skin or bowels.

Purging waters derive their effects from the neutral salts they contain, especially the muriates of soda, lime, and magnesia, and the sulphates of soda and magnesia. They are much more frequently used for a length of time to keep the bowels open by exciting the natural action, than to produce full purging. Used in this way, instead of debilitating the patient, they increase his appetite, health, and strength.

Chalybeate waters are used as tonics. They stimulate considerably, and increase the circulation; but as they also generally contain neutral salts, they act as gentle laxatives. They are used in all cases of debility, cachexia, chlorosis, fluor albus, amenorrhœa, and in general in what are called nervous diseases.

The external use of water depends almost entirely on its temperature, which may be,

1. Greater than that of the body,
    - *a.* As in the state of vapour. The vapour bath.
    - *b.* Above 97° F. The hot bath.
2. Below the temperature of the body.
    - *a.* From 97 to 85, the warm bath.
    - *b.* From 85 to 65, the tepid bath.
    - *c.* From 65 to 32, the cold bath.

The vapour bath is a popular remedy in many countries, both in the most civilized and rudest state of society. Some rude nations cure many diseases by throwing water on heated stones, and exposing the patients to the vapour produced. The vapour baths of the Russians have been described by every one who has published his travels in that country. The vapour is often heated in them as high as 150° Fahr.; in which the Russians remain for hours. They do not, however, expose themselves at once to so high a temperature. When they enter, they are obliged to remain some time with their heads bent towards the ground, and then to sit at first on the lower steps, with which the bath is surrounded in the manner of an amphitheatre. As they ascend to the higher and hotter stages, they throw a little cold water, which they take with them, over their neck and shoulders. From the bath they repeatedly run out with their skin as red as scarlet, and roll themselves in the snow, or plunge into the coldest water they can find, with delight and impunity. They then dry and dress themselves, and go home wrapt up in their pellices.

The modern Egyptians also make great use of the vapour-bath; but their arrangement is considerably different, and the temperature seldom carried higher than 110° F.

Celsus and Aretæus may be consulted for the use of the vapour-bath among the ancients.

The use of the vapour-bath, chiefly, however, medicated, has been very generally introduced into France by MM. Gales and D'Arcet, into Germany by De Carro, and into Italy by Assalini; and in my own practice, I have seen scaly cutaneous diseases, which had resisted for years every other treatment, yield in a short time to the use of the vapour-bath. Its action in relaxing stiff joints is also striking. Its immediate effects are to accelerate the circulation, and to excite profuse sweating. In general the vapour of water alone is sufficient, but more frequently it is medicated with different impregnations. The following are Assalini's indications for their use:

1. To excite the cutaneous system, restore the transpiration, and promote sweat. 2. To soften the cutaneous texture, and relax some parts affected with inflammation. 3. To allay increased sensibility of the nervous system. 4. To promote the eruption of exanthematous and herpetic (?) diseases, and to drive gouty or morbid humours from the noble organs to those less essential to life. 5. To combat organic skin diseases of an herpetic or scabious nature, and tinea itself. 6. To shorten the cure of syphilis. 7. To cause the re-absorption of lymph arrested in the lymphatic glands, and in the cellular tissue of the joints. 8. To restore the action and lost tone of the mucous membranes. 9. To revive

muscular action and that of the organs of digestion. 10. To promote the cicatrization of chronic ulcers.

The hot bath is decidedly stimulant in its action. It renders the pulse frequent, the veins turgid, the skin red, the face flushed, and the respiration quick, increases animal heat, and produces sweat. If the temperature be very high, the face becomes bathed in sweat, the arteries at the neck and temples beat with violence, anxiety and a sense of suffocation are induced, and, if persisted in, vertigo, throbbing in the head, and apoplexy, are the consequences. It is very rarely employed in medicine, except where there are hot springs. The Russians, and some other nations, use the hot bath as an article of luxury.

The effects of the affusion of hot water have not been ascertained, although employed as a luxury in some places in India; and it is probable that when the heat is not so great as to destroy the organization of the skin, the very transient application of the water may be more than counteracted by the subsequent evaporation.

With regard to the action arising from their temperature, all baths below 97° differ only in degree, as they all ultimately abstract caloric from the surface, but with a force inversely as their temperature.

The warm bath excites the sensation of warmth, partly because our sensations are merely relative, and partly because its temperature, though less than that of the internal parts of the body, is actually greater than that of the extremities, which are the chief organs of touch. The warm bath diminishes the frequency of the pulse, especially when it has been previously greater than natural, and this effect is always in proportion to the time of immersion. It also renders the respiration slower, and lessens the temperature of the body, relaxes the muscular fibre, increases the bulk of the fluids by absorption, removes impurities from the surface, promotes the desquamation and renewal of the cuticle, and softens the nails, and indurations of the skin.

The stimulant power of the warm bath is therefore not very considerable, and its employment in disease will be chiefly indicated by preternatural heat of the surface and frequency of the pulse, rigidity of the muscular fibre, and morbid affections of the skin. It has accordingly been found serviceable in many cases of pyrexia, both febrile and exanthematous, in many spasmodic diseases, and in most of the impetigines. It is contra-indicated by difficulty of breathing, and internal organic affections, and should not be used when the stomach is full.

The affusion of warm water very generally produces a considerable diminution of heat, a diminished frequency of pulse and respiration, and a tendency to repose and sleep; but its effects are not very permanent, and its stimulus is weak. It is recommended in febrile diseases depending on the stimulus of preternatural heat, and in those attended with laborious respiration, and in the paroxysms of hectic fever.

As the tepid bath and affusion produce effects intermediate between those of warm and cold water, it is unnecessary to enumerate them.

The cold bath produces the sensation of cold, which gradually ceases, and is succeeded by numbness. It excites tremors in the skin and shivering. The skin becomes pale, contracted, and acquires the appearance termed *Cutis anserina.* The fluids are diminished in volume, the solids are contracted, the caliber of the vessels is lessened, and therefore numbness and paleness are induced, and the visible cutaneous veins become at first smaller, afterwards turgid. There is a sense of drowsiness and inactivity, the joints become rigid and inflexible, and the limbs are affected with pains and spasmodic contractions. The respiration is rendered quick and irregular, the pulse slow and small; the internal heat is at first diminished, but gradually and irregularly returns nearly to its natural standard; the extremities, however, continue cold and numb, or swollen and livid; the perspiration is suppressed, and the discharge of urine is rendered more frequent and copious. If the cold be excessive on its application, long continued violent shiverings are induced, the pulse ceases at the wrist, the motion of the heart becomes feeble and languid, there is a sensation of coldness and faintness at the stomach, and a rapid diminution of animal heat; and at last delirium, torpor and death are the consequences. If the cold bath be not carried to excess, on emerging from the water, the whole body is pervaded by an agreeable sensation of warmth, and the patient feels refreshed and invigorated.

The primary action of the cold bath is stimulant, and the degree of this action is in proportion to the lowness of its temperature. This opinion is indeed directly opposite to a theory of cold which has been advanced with the confidence of demonstration. But, in fact, the action of cold is by no means simple. It is complicated, and varies according to its intensity, duration, and the state of the system to which it is applied. It acts at first as a stimulant, in exciting sensation; then as a tonic in condensing the living fibre; and, lastly, however paradoxical it may appear, as a sedative, by preventing that distribution of blood in the minute and ultimate vessels, which is necessary for the existence of sensibility and irritability, and by the abstraction of the stimulus of heat.

The cold bath may be therefore so managed as to procure any of these effects by regulating the length of time for which it is applied.

Cold affusion, or the pouring of cold water over the body, is a very convenient mode of using the cold bath in many cases. In this way cold is very suddenly applied to the surface, its operation is instantaneous and momentary; but by repeated affusions, its extreme effects may at last be produced. Where the effects of cold affusion may be thought too severe, sponging the body with cold water, or water and vinegar, may be substituted.

The application of cold may be employed in fevers and febrile paroxysms, when the heat is steadily above the natural standard, and in many diseases arising from relaxation and debility. It is contra-indicated when the heat of the body is below 97°, when there is any notable perspiration from the surface, and when there is general plethora. Irritable habits should be defended from the violence of its action by covering the body with flannel.

In ardent fever, especially in those cases in which the heat of the skin is excessive, it is particularly useful, and ought to be long continued. In phrenitis, and other local inflammations, it promises to be of advantage. In gout its effects are doubtful, being in some instances salutary, in others destructive. A criterion, to enable us to determine when it ought or ought not to be resorted to in this disease, is much wanted. In inflammatory rheumatism and rheumatic gout it is decidedly useful. It is of advantage in all the hæmorrhagies and exanthemata; in tetanus, colic, cholera, hysteria, mania, ischuria, and in burns; and in general in all those local diseases in which solutions of acetate of lead, of muriate of ammonia, &c. are usually employed; for the good effects of these depend almost entirely on the diminished temperature.

ARBUTUS UVA URSI[*]. *Ed. Dub. Lond.*

Willd. *g.* 871, *sp.* 7; Smith, *g.* 203, *sp.* 3. *Decandria Monogynia.*—Nat. ord. *Bicornes,* Linn., *Ericineæ,* Juss.

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[*] *Syn.* La bousserolle, le raisin d'ours, l'arbousier trainant, (*Fr*). Die Bärentraube, die spanische Heidelbeere, (*Ger*). Corbezzolo, uva d'orso, (*It*).

Whortleberry. Red-berried trailing arbutus, Bearberry.

Officinal.—The leaves.

Folia arbuti uvæ ursi. *Ed.* Folia uvæ ursi. *Lond. Dub.*

This is a very small evergreen shrub, which is referred by Sprengel to a new genus, Arctostaphylos of Adanson. It grows wild in the woods, and on sand hills in Scotland, and in almost every country in Europe. It is also very common in New England and other parts of America. The leaves are oval, not toothed, and their under surface is smooth and pale green. The leaves of this shrub are very similar to those of the *Airelle rouge, Vaccinium vitis idæa,* red whortleberry. Braconnot has observed that the greater part of the *Uva ursi* in commerce is in fact the red whortleberry. Hayne has given a full diagnosis of these two plants. To the apothecary the differences of the leaves are most important. Those of the *Vitis idæa* are obovate, or roundish obovate; edges revolute; fine cartilaginous towards the point; sparsely fine sawed, and dotted beneath. Those of the *Uva ursi* are longish obovate; edges pretty even, perfectly entire, reticulated beneath, and without any points.

The *green* leaves alone, Dr Bourne says, should be selected and picked from the twigs, and dried by exposure to a moderate heat. The powder, when properly prepared, is of a light brown colour, with a shade of greenish yellow, has nearly the smell of good grass hay, as cut from the rick, and to the taste is at first smartly astringent and bitterish, which sensations gradually soften into a liquorice flavour. Digested in alcohol they give out a green tincture, which is rendered turbid by water, and when filtered passes transparent and yellow, while a green resin remains on the filter. They are powerfully astringent, approaching, in the deepness of the colour which they give to red sulphate of iron, more nearly to nutgalls, than any substance I have tried. Indeed, in some parts of Russia, they are used for tanning. MM. Melandri and Moretti have analyzed the *Uva ursi,* and have found in it tannin and gallic acid. These principles are not found in the *Vitis idæa,* which circumstance serves to distinguish the leaves of these two plants.

Med. use.—The medical effects of this medicine depend entirely on its astringent and tonic powers. It is therefore used in various fluxes arising from debility, menorrhagia, fluor albus, cystirrhœa, diabetes, enuresis, diarrhœa, dysentery, &c. It has been strongly recommended in phthisical complaints by Dr Bourne, and in diseases of the urinary organs by De Haen, particularly in ulcerations of the kidneys and bladder. With this view it is a popular remedy in America, and Dr Barton recommends it strongly in nephritic complaints and in gleet. It certainly alleviates the dyspeptic symptoms accompanying nephritic complaints. It is commonly given in the form of powder, in doses of from 20 to 60 grains three or four times a-day.

ARCTIUM LAPPA. *Ed. Dub.*

Willd. *g.* 1429; Spr. *g.* 2650, *sp.* 1; Smith, *g.* 352, *sp.* 1. *Syngenesia Polygamia Æqualis.*—Nat. ord. *Compositæ Capitatæ*, Linn., *Synantheræ*, sect. *Carduaceæ*, Juss.

Burdock. Clit-bur *.

Officinal.—The root.

a) RADIX ARCTII LAPPÆ. *Ed. Dub.*
b) SEMINA ARCTII LAPPÆ. *Dub. Ed.*

THIS is a biennial indigenous plant, frequent in uncultivated places. The roots are indiscriminately collected from the *Arctium Lappa* and the *A. Bardana*, which Linnæus considered as varieties only, but which were ascertained by Willdenow to be distinct species. Burdock root is subcylindrical, externally black-brown, internally white; root fleshy when recent, scaly when dried; having a weak unpleasant smell; bark has a subsaline, and the parenchyme a sweetish mucilaginous taste. It is to be collected in spring, and loses four-fifths of its weight by drying.

M. Guibourt says it contains a great quantity of inuline. Its stalk and leaves furnish potass by combustion; and they also contain nitrate of potass.

The seeds have a bitterish subacrid taste.

Med. use.—The roots are esteemed aperient, diuretic, and sudorific, and are said to act without irritation, so as to be safely ventured upon in acute disorders. Decoctions of them have been used in rheumatic, gouty, venereal, leprous, and other disorders, and are preferred by some to those of sarsaparilla. The seeds are recommended as very efficacious diuretics, given either in the form of emulsion, or in powder, to the quantity of a drachm.

ARGENTUM. *Ed. Dub.* ARGENTUM; Argentum purificatum. *Lond.*

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* *Syn.* Αρκειον, (*Dios.*) Bardane, Glouteron, (*Fr.*) Filzigeklette, Waldklette, (*Ger.*) Lappola, Bardana, (*It.*)

Silver. Silver leaf[*].

Metallic silver is very brilliant, white, insipid, inodorous; specific gravity 10.474 to 11.091; hardness between iron and gold; elasticity between gold and copper; strong acute sound; considerable ductility and tenacity; hardening much under the hammer; a good conductor of electricity, caloric, and galvanism: fusible at 28° Wedgwood; crystallizable by cooling; unalterable in the air; changed into a greenish oxide by long and intense heat, burning with a greenish flame; and instantly by the electric shock. Its phosphuret is granulated, brittle, and fusible; its sulphuret grey, black, lamellated, or striated, and fusible; it unites but slightly with the acidifiable metals and iron; is hardened by gold, bismuth, antimony, tin, lead, and copper, and amalgamates with mercury. It is oxidized and dissolved by the sulphuric, sulphurous, and nitric acids, and combines with chlorine. Its oxide is olive; reducible by the other metals, hydrogen, and light and heat; colours some glasses of an olive green, and is very soluble in ammonia.

Silver is found, in its metallic state, either pure, or alloyed with gold, antimony, iron and arsenic, or bismuth and lead; combined with sulphur alone; also sulphuretted silver, with antimony, iron, and arsenic; or with lead and antimony; or combined with chlorine; or, lastly, oxidized; combined with sulphur and oxide of antimony; or combined with carbonic acid and antimony.

Off. Prep.—Argenti nitras, *L. E.* Argenti nitras fusum, *D.* Argenti nitratis crystalli, *D.*

Aristolochia serpentaria[†]. *Ed. Lond. Dub.*

Spr. 3050, *sp.* 47. *Gynandria Hexandria;* Willd. *g.* 1609, *sp.* 27. Nat. ord. *Sarmentosæ,* Linn., *Aristolochiæ,* Juss.

Virginian Snake-root.

Officinal.—The root.

Radix aristolochiæ serpentariæ. *Ed. Dub.* Radix serpentariæ. *Lond.*

This plant is indigenous in mountainous situations in Carolina and Virginia. The root is perennial and creeping.

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[*] *Syn.* L'argent, (*Fr.*) Silber, (*Ger.*) Argento, (*Ital.*) Plata, (*Span.*) Vellie, (*Tam.*) Rūpā, (*Dak. and Hind.*) Fazzeh, (*Arab.*) Nokra, (*Pers.*) Vendie, (*Tel.*) Perāk, (*Mal.*) Peddie, (*Cyn.*) Rajata, Rúpya, (*Sans.*) Yin, (*Chin.*)

[†] *Syn.* Serpentaire de Virginie, (*Fr.*) Virginische Schangenwurzel, (*Germ.*) Serpentaria Virginiana, (*It.*)

The stalk annual. The dried root consists of a short premorse stock or head, with very numerous radicles, three inches and more long, filiform, flexuose, interlaced and brittle; epidermis greenish yellow, or brown; parenchyme yellowish white, and pith ferrugineous. It has a pungent smell, not unlike that of valerian, with camphor and turpentine; and a warm, bitterish, pungent taste, very much resembling that of camphor. I find that, treated with alcohol, it affords a bright green tincture, which is rendered turbid by water; by filtration a small portion of a green matter is separated, but its transparency is not restored. It neither precipitates tannin or gelatine, nor affects the salts of iron or tincture of turnsole. When the tincture diluted with water is distilled, the spirit and water pass over milky, strongly impregnated with its peculiar flavour.

By M. Chevallier's analysis it contains volatile oil, resin, gum, starch, a yellow bitter principle, malic and phosphoric acids. Chevallier thinks that the active principle has much analogy with the bitter principle got from *Quassia amara* by Dr T. Thomson, and the principle obtained from Bryony root (*Bryonia alba*), and from colocynth (*Cucumis colocynthis*), by Vauquelin. According to Bucholz its components are, volatile oil, 5; yellowish gum-resin, 28½; extractive matter (Saponaceous, Bucholz), 17; gummy extract, 181; woody fibre, 624; water, 144½ = 1000. Bucholz concludes that the characteristic ingredients are the volatile oil,—which, however, exists in very small quantity,—and a soft resin, which has many of the properties of an oil, and is also bitter, as is still more remarkably the saponaceous extractive. Bucholz found that he could not separate the saponaceous principle entirely from the gummy extractive when they were dried, and that it was better to redissolve the extract in distilled water, so as to have the consistence of a syrup, and then to add absolute alcohol until the clear liquor was not affected by a further addition. By evaporation he now obtained the saponaceous extractive of a yellow brown, verging to red, strongly deliquescent, of a penetrating bitter taste, and almost entirely soluble in absolute alcohol.

Med. use.—Its virtues are principally owing to the essential oil and extractive. Its general action is heating and stimulant; its particular effects, to promote the discharge by the skin and urine. In its effects it therefore coincides with camphor, but seems to be a more permanent stimulus.

It is recommended, 1. In intermittent fevers, especially when the paroxysms do not terminate by sweating, and to assist the action of Peruvian bark in obstinate cases. In some parts of America, its tincture or infusion is the common morning dram in aguish situations. 2. In typhus and in putrid diseases, to support the *vis vitæ*, and to excite gentle diaphoresis. 3. In exanthematous diseases, when the fever is of the typhoid type, to support the action of the skin and keep out the eruption. 4. In gangrene. Externally it is used as a gargle in the putrid sore throat.

Dose.—It is exhibited, 1. In powder, which is the best form, in doses of twenty or thirty grains. 2. In infusion with wine or water. By decoction its powers are entirely destroyed. It is often combined with Peruvian bark, or with camphor.

Off. Prep.—Tinct. aristoloch. serpent. *E.* T. serpentariæ, *L. D.* T. cinch. comp. *L. D. E.*

ARMORACIÆ RADIX. *Lond.* See COCHLEARIA.

ARNICA MONTANA. *Ed. Dub.*

Willd. *g.* 1491, *sp.* 1; Spr. *g.* 2771, *sp.* 6. *Syngenesia Polygamia superflua.*—Nat. ord. *Compositæ radiatæ*, Linn., *Synantheræ*, sect. *Corymbiferæ*, Juss.

German Leopard's bane *.

Officinal.—The flowers, root, and leaves.

a) FLORES ARNICÆ MONTANÆ. *Ed. Dub.*

LEOPARD'S-BANE is a very common perennial plant in the alpine parts of Germany, Sweden, Lapland and Switzerland. It is also found abundantly in Portugal.

The flowers are compound, radiated, yellow, with a calyx of linear equal follicles the length of the disc, ligulate floscules twice the length of the disc, two lines broad, three-toothed, with a sessile pappus, fragile and somewhat scabrous; taste acrid and bitterish; causing sneezing when rubbed with the fingers. They are to be collected when they first open. Their active constituents are not sufficiently ascertained. They contain an aromatic principle, and modified tannin, according to Mercier; also an acrid resin, and an unexamined peculiar vegetable principle, as pointed out by Weber.

MM. Chevallier and Lassaigne have discovered a bitter nauseous matter resembling cytisine. Martini found in *Arnica* a little volatile oil of a blue colour.

The diversity of the effects of different parcels of the flowers was long known; but Le Mercier found that the acrimony of some of them was owing to the larva of an insect which frequently occurs in them. These larvæ were by Buchner found to belong to the *Atherix maculatus*. They were black, oval, about the size of mouse-dung, friable when dry, and contained a pale yellow clammy substance, which has an acrid taste. Le Mercier obtained from them an acrid principle soluble in alcohol and in ether.

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* *Syn.* Tabac des Verges, Betoine de montagne, Doronic d'Allemagne, (*Fr.*) Wohlverlei, Fallkraut, (*Ger.*) Arnica montana, (*It.*)

M. Dupuytren made experiments in the Hotel-Dieu at Paris, which establish that the emetic action of *Arnica* is caused by particles of down, which remain suspended in the infusion. If the infusion be filtered, the irritating action does not occur.

The flowers of the *Inula dysenterica*, *I. salicina*, *Hypochæris maculata*, and *Scorzonera humilis*, have been said to be substituted for those of the Arnica; but as Hayne well remarks, it would be more difficult to distinguish them from those of the *Doronicum pardalianches* and *D. scorpioides*. The root of the *Betonica officinalis* and *Inula dysenterica* have been substituted for the roots.

b) RADIX ARNICÆ. *Dub. Ed.*

THE dried rhizoma (root) of this plant is about the thickness of a small quill, flexuose, externally brown, longitudinally rugose, with a brown bark, hardish whitish wood, larger pith, emitting long dense radicles on one side. Its taste is aromatic, acrid, and slightly bitter. They are to be gathered in spring. Neumann extracted from 960 parts 840 watery extract, and 5 alcoholic; and inversely 270 alcoholic, and 540 watery.

Med. use.—It is exhibited in the same manner and circumstances as the flowers, but is more apt to excite vomiting.

In powder, its dose is from five to ten grains.

c) FOLIA ARNICÆ. *D.* The leaves are oblong, attenuated towards the petiole, three nerved, very entire, more or less pubescent, of a pale greenish colour, and of a subacrid and bitterish taste. They are to be gathered in May.

Med. use.—The various parts of the Arnica, although much employed on the Continent, so that with the German boors it has got the name of *Panacea lapsorum*, are as yet little used in Britain. The plant is rejected by all animals except the goat. In their effects the flowers especially are stimulating, and supposed to be discutient. In small doses, and properly administered, they possess very beneficial effects, in raising the pulse, in exciting the action of the whole sanguiferous system, in checking diarrhœas, in promoting expectoration, and, most particularly, in removing paralytic affections of the voluntary muscles; but their use is frequently attended with no sensible operation, except that in some cases of paralysis, the cure is said to be preceded by a peculiar pricking, and by shooting pains in the affected parts. When given improperly, or in too large doses, they excite an insupportable degree of anxiety, shooting and burning pains, and even dangerous hæmorrhagies, vomiting, vertigo, and coma. For these alarming symptoms, vinegar is said to be the best remedy.

They have been recommended, in paralytic disorders, in chronic rheumatism, in retention of the urine from paralysis of the bladder, in amaurosis; in intermittent fevers, combined with Peruvian bark; in dysentery and diarrhœa, but in some cases they have had bad effects; in putrid diseases; in typhoid inflammations; to promote the uterine discharge; and in internal pains, and congestions from bruises. In the countries where they are indigenous, they have long been a popular remedy in such accidents. They are contra-indicated by an inflammatory diathesis, a predisposition to hæmorrhagies, and internal congestion.

They are best exhibited in the form of infusion. One or two scruples may be infused in half a pound of water, and drunk at proper intervals. The flowers should be wrapt up in a piece of linen, as otherwise their down is apt to be diffused in the liquid, and to cause violent irritation of the throat.

ARSENICUM ALBUM *, s. s. Acidum Arseniosum. *Lond.*

Oxide of Arsenic. Arsenious acid.

THIS substance, which was formerly named, improperly, Arsenic, is most generally obtained in the process of roasting the ores of cobalt in Saxony. The roasting is performed in a kind of reverberatory furnace, with which a very long chimney is connected, lying in a horizontal direction. The arsenious acid is condensed in it in the form of a loose grey powder, which, by a second sublimation with a little potash, and in a great degree of heat, coalesces into a firm vitreous sublimate, which gradually becomes opaque, like white enamel, by exposure to the air. In this state, it is the white arsenic of commerce, or, as it should be termed, the arsenious acid. For internal use, the lumps of a shining appearance and dazzling whiteness should be chosen; but it is generally offered for sale in the form of a fine smooth powder, which is very often mixed with chalk or gypsum. The fraud is easily detected by exposing it to heat. The arsenious acid is entirely sublimed, and the additions remain behind.

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* *Syn.* Arsenic, (*Fr.*) Arsenik, weisse Arsenik, (*Ger.*) Arsenico, (*It.*) Vullay Pāshānum, (*Tam.*) Suffāid soombul, (*Duk.*) Turab ul halic, (*Arab.*) Súm ulfār, (*Pers.*) Sumboolkhar, (*Hind.*) Wrongon, (*Mal.*) Tela pāshānum, (*Tel.*)

As this substance is one of the most virulent poisons, I shall give a detailed account of its properties. It is white, compact, brittle, and of a glassy appearance, sp. gr. 3.729. Its taste is scarcely perceptible, but at last sweetish. It sublimes entirely when exposed to 380° Fahrenheit. When the operation is performed in close vessels, the arsenious acid sublimes in dense white fumes, which concrete into tetrahedrons, but the crystals become gradually opaque on exposure to the air. The solubility of arsenious acid has been variously stated. Guibourt found that 1000 parts of temperate water dissolved, in 36 hours, 9.6 of the transparent variety, and 12.5 of the opaque; and the same quantity of boiling water dissolved, of the transparent variety, 97, retaining, when cooled, 18, and of the opaque variety took up 115, and retained, on cooling, 29. This solution has a slightly sweetish taste, and reddens vegetable blues. Arsenious acid is also soluble in 80 times its weight of boiling alcohol. From either solution it may be obtained regularly crystallized in tetrahedrons. From its solutions a white precipitate is thrown down by lime-water, a yellow precipitate by sulphuretted hydrogen, or water impregnated with it, or by any alkaline sulphuret or hydro-sulphuret, and, still more characteristically, a fine green precipitate by a solution of sulphate of copper, and a copious yellow precipitate by a solution of nitrate of silver. But as the addition of an alkali, in order to saturate the acid, is necessary to the success of these metallic tests, the liquid ammoniarets of copper and of silver are preferable. Mixed with a little sulphur, it sublimes of an orange or red colour. When treated with nitric acid, the arsenious acid is converted into arsenic acid. If arsenic be reduced between plates of copper, or in contact with copper-filings, it whitens them, and, lastly, the fumes of reduced arsenic have a strong alliaceous smell.

Dr Christison, the present Professor of Medical Jurisprudence in this University, to whose classical work on poisons I refer those who wish more information, has greatly simplified and improved the means of detecting arsenic, which it is important to practitioners in general to know. The suspected matter, if solid, is to be divided into minute fragments, and boiled briskly in two or three successive portions of distilled water. To this decoction, or to a suspected fluid, a little acetic acid is to be added, and the mixture to be boiled for a few minutes. It is then to be filtered, put into a deep narrow glass, and to be subjected, for half or three quarters of an hour, to a brisk stream of sulphuretted hydrogen gas. The fluid always acquires a yellowish milkiness, or a precipitate is thrown down; but before attempting to separate the precipitate, it is to be boiled. It is now to be left at rest to deposite; the supernatant liquid is to be poured off, and the precipitate, if necessary, washed with water. The precipitate is then to be thrown on a filter. After the filtration is finished, the filter is to be carefully compressed between folds of blotting paper, and the precipitate scraped off with a knife, and dried on a bit of smooth paper, at a temperature somewhat above 212°, and subjected to the test of reduction, which is to be conducted in the following manner.

The best substance for reducing arsenic on the small scale is the black flux. If the quantity of matter be not considerable, the reduction should never be attempted but in a glass tube closed at one end. It should not be above three inches long; its diameter may vary from an eighth to a fourth of an inch, according to the quantity of material. The matter should not fill above three-fourths of an inch of the length of the tube. It is introduced most easily, without soiling the tube, by placing it in a little triangular gutter of thin pasteboard, sliding this nearly to the bottom, and then knocking the sealed end gently on the table. The pasteboard being withdrawn, the sealed end of the tube is to be held (naked) in the flame of a spirit-lamp, or common blow-pipe lamp; but the former is preferable, as no blow-pipe is required, and the heat is never too violent. The open end of the tube should not be closed, as is generally recommended. The heat must be applied gently at first, otherwise the watery vapour disengaged may propel the material out of the tube. As fast as the moisture condenses on the upper part of the tube, it should be dried by a little roll of filtering paper. When the watery vapour has nearly ceased to be disengaged, a black vapour rises and condenses on the tube. This is charcoal, derived from the decomposition of the animal or vegetable matter, and carried along by the steam and gases. The arsenic does not begin to sublime till the discharge of carbonaceous vapour has nearly ceased; and it always condenses lower down, and within the shortest possible distance from that part of the tube which is exposed to the flame.

M. Serullas shows how the process of alloying is to be used for discovering arsenic in cases of poisoning by that metal. For this purpose, should the suspected matter be small in volume, it is to be dried as well as possible. It is afterwards to be mixed with forty or fifty grammes (parts?) of pure antimony, and as much cream of tartar. An alloy is then formed which will emit arseniated hydrogen, and by combustion hydruret, however small may be the quantity of arsenic present. But when the matter suspected is bulky, recourse must be had to washings and ebullition. The solution which results is mixed with potass. It is then evaporated to dryness, and the residuum is formed into an alloy. Should these first means of analysis fail in their object, the residuum of the washings must be treated with nitric acid and potass, until the animal or vegetable matters present are destroyed. The residuum dried is to be mixed with double its weight of pure antimony and of cream of tartar, and submitted to the operation of alloying.

Four grains of the oxide of arsenic, triturated and mixed with three pounds of an alimentary mass artificially prepared, yielded, by the manipulations described, an alloy sufficiently arsenical to show that the process will succeed with very minute quantities.

Arsenious acid is used by the dyers, as a flux in glass making, in docimastic works, and in some glazes. Arsenious sulphurets are much used by painters, but on the other hand these advantages are attended with bad effects. In mines, it causes the destruction of numbers who explore them. The property which it possesses of being soluble in water, increases and facilitates its destructive power; and its sale ought to be prohibited to unknown persons. Arsenious acid is every day the instrument by which victims are sacrificed, either by wickedness or imprudence. It has been mistaken for sugar or cream of tartar, and it is given clandestinely as a poison. The only symptoms which characterize its action are, pains in the stomach and bowels, vomiting of glairy or bloody matter, purging, with cold sweats and trembling, very much like *cholera*. Sometimes there are no pains, only debility and fainting, with vomiting and purging.

On dissection, the stomach and bowels are sometimes found to be inflamed, and corrugated or gangrenous; rarely corroded. The lungs are frequently marked with livid spots. Sometimes there is no morbid appearance to be discovered. The state of the blood is very various, as well as the external appearance of the body, which is sometimes perfectly natural. When the quantity is so very small as not to prove fatal, tremors, palsies and lingering hectics sometimes succeed.

Mucilaginous drinks have been long ago given to persons poisoned by arsenic. Milk, fat, oils and butter, have been successively employed. M. Navier has proposed, as a more direct counter-poison, one drachm of sulphuret of potass to be dissolved in a pint of water, which the patient is directed to drink at several draughts; the sulphur is supposed to unite with the arsenic, and destroy its causticity and effects. When the first symptoms are alleviated, he advises the use of sulphureous mineral waters. He likewise approves of the use of milk, but condemns oils. Vinegar, which dissolves arsenic, has been recommended by M. Sage. According to Hahneman, a solution of soap is the best remedy. One pound of soap may be dissolved in four pounds of water, and a cupful of this solution may be drunk lukewarm every three or four minutes. These may be tried; but M. Orfila agrees with Renault in thinking that no antidote has yet been discovered. Bloodletting has lately been recommended in cases of poisoning from arsenic, on the idea that the death is the consequence of inflammation; but death often takes place without inflammation.

Med. use.—Notwithstanding the very violent effects of arsenious acid, it has, however, been employed in the cure of diseases, both applied externally, and taken internally.

Externally, it has been chiefly employed as an escharotic in cases of cancer.

Various methods of using arsenic externally have been recommended, but they all resolve themselves into the means of moderating its action. Sulphur has been thought to have a specific effect in this way, but without foundation. It only acts as an inert powder, diluting the arsenic. Its admixture with ointments and extracts, in like manner, prevents the arsenic from coming so fully in contact with the surface to which it is applied. Opium operates by reducing the sensibility of the part, and, in a larger dose, of the system, while the local action of the arsenic is reduced in no greater a degree than it would be by the addition of an equal quantity of any inert extract. Charcoal is also said to have a specific power in diminishing the poisonous action of arsenic.

Justamond used an ointment composed of four grains of white oxide of arsenic, ten grains of opium, and a drachm of cerate, spread very thin upon linen. He also fumigated cancerous sores with sulphuret of arsenic, with a view to destroy their intolerable fetor, with great success. Le Febure washed cancerous sores frequently, in the course of the day, with a solution of four grains of arsenious acid in two pounds of water. Arnemann recommends an ointment of one drachm of arsenious acid, the same quantity of sulphur, an ounce of distilled vinegar, and an ounce of ointment of white oxide of lead; but it must be observed that arsenic acts upon different principles from other escharotics, which either act chemically on the parts with which they come in contact, destroying alike the sound and the diseased, or by inducing inflammation and consequent suppuration or sphacelation of the surface; whereas arsenic seems to act by destroying the feeble vitality of the diseased formation in its whole extent, causing it to be thrown out of the system as a substance foreign to its nature; and thus, when arsenic succeeds, the morbid part is separated in a mass. This fortunate termination is, however, exceedingly rare. More commonly the ulceration proceeds more rapidly than before; and in some cases its application has been the direct cause of death, by poisoning the patient, in consequence of its absorption. This, I am convinced, is apt to take place whenever arsenic is applied to a *bleeding* surface; for, by experiment, I find that a much smaller quantity produces its poisonous effects when introduced into a wound than when swallowed into the stomach. To a suppurating, but otherwise entire surface, it has often been applied with the greatest freedom, without producing any poisonous effects.

Löffler imagines, that the arsenical solution, applied externally, is the most effectual preventive of hydrophobia. He washes the wound with it, and applies it on compresses until it heal or suppurate. Baumann's cancer powder consists of equal parts of white arsenic, purified nitre, subcarbonate of potass, and finely powdered arum root, with as much soot as to give the powder a grey colour. Hellmund's treatment of cancer consisted of two preparations. One was called *Pulvis Cosmi.* It was a finely triturated powder of white arsenic ℈ij., ashes of old shoe soles, g^{r}. xii., dragon's blood, g^{r}. xvi., and factitious cinnabar, ʒij. Another was named *Unguent. narcotico-balsamicum*, which was formed of black peruvian balsam and extract of hemlock, of each ℥ſs., crystallized acetate of lead, ℈iv., saffron-tincture of opium, ℈ij., and wax ointment, ℥iv. exactly mixed together. One drachm of the powder mixed with one ounce of the ointment formed the compound arsenical ointment. The mode of treatment was to spread the ointment upon a pledget of very soft lint, so as to cover not only the sore, but a line breadth beyond its edge. It was left on for 24 hours, and then softened with a tepid decoction of elder flowers, and removed. This was repeated for five days. During the next seven days, the sore was dressed with the narcotico-balsamic ointment alone; and if any part of the sore was not perfectly clean, the arsenic ointment was applied for two days. The cure was said to be commonly effected in 20, or at most 40 dressings. The pain was slight and short. From trials in the *Charité* at Berlin, it appeared that this treatment was of no use in *fungus hæmatodes*; that it was useful in some cases of cancer of the breast, and that it was very efficacious in cutaneous cancer, and in phagedenic and scurfy cutaneous affections. Plunket's arsenical caustic consisted of one drachm of the leaves of the Ranunculus acris, and Flammula vulgaris, beat into a pulp, with which one drachm of levigated arsenic and four scruples of flowers of sulphur were intimately incorporated. This was made into balls, and dried in the sun. Its mode of application was to reduce the balls to powder, to mix the powder up with yolk of egg, to apply it on a piece of pig's bladder on the surface of the cancer, and allow it to remain until the eschar fell off spontaneously. Sir C. Blicke found it also useful in malignant ulceration at the roots of the nails. Mr Carmichael of Dublin uses, against open cancer, a salve composed of half a drachm of arseniated iron, two drachms of phosphate of iron, and six drachms of spermaceti ointment.

Internally, arsenic may be exhibited in the form,

1. Of arsenious acid dissolved in distilled water, in the proportion of four grains to a pint. A table spoonful of this solution, mixed with an equal quantity of milk, and a little syrup of poppies, is directed to be taken every morning fasting, and the frequency of the dose gradually increased until six table spoonfuls be taken daily. M. Le Febure's method of curing cancer.

2. Of arsenite of potass, an officinal preparation.

3. Of arseniate of potass. Mix well together equal quantities of nitrate of potass, and of pure arsenious acid; put them into a retort, and distil at first with a gentle heat, and afterwards with so strong a heat as to redden the bottom of the retort. In this process the nitric acid of the nitre is partly decomposed, and passes over into the receiver in the state of nitrous acid. The arsenious acid is at the same time converted into arsenic acid, and combines with the potass. The product, which is arseniate of potass, is found in the bottom of the retort, and may be obtained in the form of crystals, of a prismatic figure, by dissolving it in distilled water, filtering the solution through paper, evaporating, and crystallizing. An arseniate of soda may be prepared in the same way by decomposing arsenious acid with nitrate of

soda. The advantages of these preparations are their uniformity and ready solubility, by which their dose can be better regulated than that of the arsenite.

4. Arsenious acid, in substance, to the extent of an eighth of a grain for a dose, combined with a little sublimed sulphur, has been said to be exhibited in some very obstinate cases of cutaneous diseases, and with the best effect. The sulphur seems merely to divide the arsenic.

5. Combined with six times its weight of black pepper, by long trituration, it is given by the native physicians in the East Indies for the cure of the Persian fire (syphilis,) and a species of elephantiasis, called juzam. The effect of the pepper is very doubtful.

The internal use of arsenic has been lately much extended, in consequence of the observations of Dr Fowler, Mr Jenkinson, Dr Bardsley, Dr Kellie, Mr Hill, &c. Before Dr Fowler wrote, it was indeed in use empirically, for the cure of cancers, and even as a popular remedy, in various countries; in the East Indies, against cutaneous affections; and in the fens of Hungary and Lincolnshire, against the ague. But Dr Fowler, by that inductive method of ascertaining its effects which he so successfully practised, first recommended it to the notice of regular practitioners. He confined himself to the advantages derived from it in periodical diseases, and in the disease described by Dr Haygarth under the title of nodosity of the joints; but Mr Jenkinson has, more recently, extended the use of it to certain painful affections of "very long standing, attended with great de-"bility, and local affections, not of the muscles and integu-"ments, but of the ends of the bones, cartilages, or liga-"ments, or of all three together." He thinks it hurtful in recent affections, except where there are regular intermissions. For a complete list of the diseases in which it has been tried, Mr Hill's paper in the Edinburgh Medical Journal, vol. v. and vi. may be consulted. More recently the internal use of the *Liquor arsenicalis* has been recommended in chorea by Dr G. Gregory and others; 3–7 drops given three times a-day were successful, after every other remedy had failed.

The great difficulty attending the exhibition of so very active a remedy, is regulating the dose so as to produce the full effect, without carrying it farther than is absolutely necessary. Dr Kellie has accurately pointed out the precautions to be observed with this view. He always gives arsenic immediately after meals, under the idea that it will be less apt to affect the stomach when full than when empty.

"From all I have observed, I have little apprehension of risk in a guarded and judicious use of the arsenical solution. It will always be proper to begin with the smallest doses, in order to ascertain how it agrees with the stomach. Having suited the dose to this, the feeling of swelling and stiffness of the palpebræ and face, heat, soreness, and itching of the tarsi, or tenderness of the mouth, are proofs that the medicine is exerting its specific effects on the constitution; that the dose has been carried to a sufficient length; and that it is time to decrease the dose, and attentively to watch its future effects. On the appearance of erythema, or salivation, it is time to interrupt, altogether, for a while, the exhibition of arsenic; if necessary, it may be resumed when these symptoms have vanished. If pain of the stomach, nausea, or vomiting supervene; if the head be affected with pain or vertigo; or should a cough, with any signs of irritation of the pulmonary organs, be observed, the use of arsenic should be totally and for ever abandoned."

Off. Prep.—Arsenici oxydum album sublimatum, *D.* Liquor arsenicalis, *L.* Solutio arsenicalis, *E.*

ARTEMISIA.

Willd. *g.* 1743; Spr. *g.* 2730. *Syngenesia Polygamia superflua.*—Nat. ord. *Compositæ discoideæ*, Linn., *Synantheræ*, sect. *Corymbiferæ*, Juss.

Sp. 26. ARTEMISIA SANTONICA[*]. *Ed. Dub.*
Wormseed.

Off.—The tops.
CACUMINA ARTEMISII SANTONICI. *Ed.* SEMINA SANTONICI, *Dub.*

THE Edinburgh and Dublin Colleges have named this species as the plant which produces the wormseed; but the fact is by no means ascertained. They have been ascribed by different writers to other species of the same genus, the Judaica, sp. 33. Spr.; the Contra, sp. 32; and the Austriaca, sp. 60.; and they are even said by Saunders to be the produce of a Chenopodium, which is not probable.

There are two varieties of wormseed in commerce. The one comes from the Levant, and is much preferred to the other, brought from Barbary.

The Levant wormseed are in fact unexpanded flowers and calyxes, supposed to be those of the *Art. contra*, a native of

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[*] *Syn.* Semen binæ, Contra or Santonici, (*Lat.*) Sementine, Barbotine, Grain de Zedoaïre, (*Fr.*) Zittwersamen, Wurmsamen, (*Ger.*) Seme santo, (*It.*)

Persia. They are small, globular, turbinated, subaggregated, obtuse, greenish, smooth or scarcely pubescent, scaly; scales oval, obtuse, concave, very slightly ciliated, straight, applied, the inferior smaller than the superior; mixed with the floral peduncles, short, round, and cylindrical, and with leaves green, small, subulate, obtuse, compressed at the two extremities, carinated and smooth. Smell strong, nauseous and balsamic, developed by friction. Taste analogous, a little bitter, warm, durable, very disagreeable, and giving on mastication a very decided taste of freshness. They are often adulterated with the kind which comes from Barbary; sometimes with the unexpanded flowers of the *Art. campestris*, which are detected by the smell of wormwood, and excessive bitterness; with seeds of other genera, and even with white corallines coarsely powdered. Sometimes, when spoiled by keeping, they are dyed green to give them a fresh appearance.

The Barbary wormseed is the produce of the *Art. Judaica.* It has much general resemblance with that of the Levant, but is distinguished by being downy and greyish, instead of smooth and greenish. It is also lighter, and is mixed with some ovoid folioles not found in the other.

Neumann obtained from 480 parts of wormseed, 213 of alcoholic extract, and 110 watery; and inversely, 260 watery, and 28 alcoholic. It gave a slight flavour to water distilled from it, but no oil. But by Bouillon Lagrange its virtues are said to reside in a volatile oil, and in a resinous extractive. 500 grammes yielded 2 gr. of a volatile oil, slightly citrine colour, of an acrid and burning taste, and a smell resembling peppermint. It also yielded $\frac{13}{24}$ of alcoholic extract, and $\frac{7}{16}$ of watery. The latter was inodorous.

Med. use.—Wormseed is one of the oldest and most common anthelmintics, especially in the lumbrici of children. On account of their essential oil, they are heating and stimulating.

They are given to children in substance, to the extent of ten grains, or half a drachm, finely powdered, and strewed on bread and butter; or made into an electuary with honey or treacle; or candied with sugar; or diffused through milk, and taken in the morning, when the stomach is empty; or in infusion or decoction; but to these forms their bitterness is a strong objection. After they have been used for some days, it is customary to give a cathartic, or they are combined, from the beginning, with rhubarb, jalap, calomel, sulphate of iron, or muriate of ammonia.

Spr. 93, *sp.* 63. ARTEMISIA ABSINTHIUM[*]. *Ed. Dub. Lond.* Common Wormwood.

Off.—The leaves and flowering heads.

a) ABSINTHIUM. *Lond.* FOLIA ARTEMISIÆ ABSINTHII. *Ed.*
b) SUMMITATES FLORENTES ABSYNTHII. *Dub.* SUMMITATES ARTEMISIÆ ABSYNTHII. Summitates florentes. *Ed.*

THIS perennial herb grows by the road-sides, and on rubbish, in many parts of Britain: and about London it is cultivated for medical use. The summits have compound flowers, subglobose and pendulous; leaves, the inferior triplicato-pinnatifid, the upper bipinnatifid, and the topmost undivided; laciniæ lanciolate, broader before, covered on both sides, but especially the lower, with a silky down; taste very bitter; smell heavy and aromatic. It is gathered in July and August. The larger stalks are rejected. It has been analysed by Braconnot, who found in 500 parts 18 of an azotized substance very bitter; 8 of another almost insipid; 1.4 of a resiniform matter, very bitter; 0.9 of a volatile oil; 3 of chlorophylle; 7.5 of albumen; 1 of fæcula; 7.5 of salts of potass, and 552 of lignine and water. The volatile oil is green, camphoraceous, lighter than water, of an intense bitterness.

Med. use.—Wormwood is chiefly employed as a stomachic. Its power of promoting digestion is well known to gastronomes, with whom *l'Absynthe* is a favourite cordial. Wormwood was formerly much used for the preparation of medicated wines and ales; and it is said that beer impregnated with it intoxicates more quickly. The herb is used in antiseptic fomentations; and macerated in water it is applied to bruises to prevent the swelling and discoloration. Many persons cannot suffer the disagreeable smell of wormwood, which is apt to occasion headach; but it may be freed from it in a great measure by decoction.

The roots of the common wormwood (*Artemisia vulgaris*[†], Spr. *sp.* 41,) have lately been much used in Germany for the cure of epilepsy, on the recommendation of Dr Burdach. For this purpose the root is collected in autumn, after the stem dies, or in spring, before it shoots. The earth is removed by shaking and beating the roots, which are then dried without being washed. The hard woody stock-root, and all mouldy and decayed parts, are removed, and only the side branches of the root are preserved for use, which are distinguished by their smell, and paler colour, and more juiciness. They are spread out upon paper and dried in the shade; and as soon as they become brittle and friable, they are carefully put up. It is not recommended to keep mugwort root long in the state of powder, for it soon loses its smell. Even the fresh powder has less smell than the entire roots; and Dr Burdach is in the habit of sending to his patients the root entire, with directions to powder it as it is wanted. Its use requires no preparation of the patient. For an adult the dose is a heaped tea-spoonful of the powder, or from fifty to seventy grains. This is given in some warm beer, half an hour before the paroxysm is expected. The patient is put to bed, covered up warm, and gets some warm diluent; and if sweating should follow, so much the better. After this has spontaneously ceased, the patient must put on fresh warmed linen, and guard against cold. If the first dose should not prevent the paroxysm, another is to be taken half an hour afterwards. The remedy is to be continued as long as any symptom of the disease remains; but it should not be repeated oftener than every second day. If a third and increased dose, such as ʒiſs, does not produce a critical sweat, some *Spt. ammoniæ succin.* or a warm infusion of Arnica flowers, or of valerian or serpentaria roots, may be taken to assist it.

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[*] *Syn.* Absinthe, Grand absynthe, (*Fr.*) Wermuth, (*Ger.*) Assenzio Romano, (*It.*)

[†] *Syn.* Mugwort, (*Eng.*) L'armoise vulgaire, (*Fr.*) Erba di S. Giovanni, Canapaccia, (*It.*) Der gemeine Beyfuss, (*Ger.*)

The extract of wormwood is a simple bitter. It is used in stomach complaints, and is of great service to hypochondriacs. It is also employed in intermittent fevers, in cachectic and hydropic affections, in jaundice, and against worms. The essential oil is of a dark green colour, and contains the whole flavour of the plant. It is stimulating, and is supposed to be a powerful antispasmodic and anthelmintic.

Off. Prep.—Extractum artemisiæ absinthii, *D.*

Sp. 1. ARTEMISIA CHINENSIS * et A. INDICA. *Dub.*

Off.—The leaves; Moxa.

FOLIA ARTEMISIÆ CHINENSIS ET INDICÆ.
Moxa.

ALTHOUGH in the countries where these species are indigenous, the moxa is prepared from their leaves, it is not easy to conceive any good reason for adding them to the list of officinal plants, with which every apothecary ought to be provided, in a country where, perhaps, not even a specimen of them is to be found in the collections of the most curious.

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* *Syn.* Khi ngai, (*Chin.*)

In China the moxa is prepared from these two species. Their whole surface is covered by a very thick down, but the entire stalks and leaves are well beaten in a mortar. The product is divided into two qualities, according to their degree of fineness. The coarser is used for tinder, and the finer, made up into cones, is the moxa.

Med. use.—The application of fire to the surface of the body is one of the chief remedies in the greater number of diseases with many half-civilized nations; and in this respect their practice has found imitators among the most instructed practitioners of Europe. The moxa is a powerful counter-stimulant, and operates by producing an eschar of small extent, but of considerable depth, on the surface of the part upon which it is burnt. The pain at the time of burning is not so intense as might have been anticipated; but the separation of the eschar, which takes place slowly, is attended with considerable irritation. It is chiefly useful in deep-seated inflammations, such as white-swelling of the knee or carious vertebræ; and in very painful diseases, as sciatica, and other varieties of neuralgia. The moxa is burnt as near the affected part as possible; and it is frequently necessary to apply several of them, or rather to repeat their application more than once. For the various diseases in which moxa has been applied, the treatise of Baron Larrey, in his article *Moxa*, in the *Dictionaire des Sciences Medicales,* may be consulted, and the article *Moxibustion* for the mode of conducting the operation.

ASARUM EUROPÆUM [*]. *Ed. Dub. Lond.*

Willd. *g.* 925; Spr. *g.* 1785, *sp.* 1; Smith, *g.* 222, *sp.* 1. *Dodecandria Monogynia.* — Nat. ord. *Sarmentaceæ,* Linn., *Aristolochiæ,* Juss.

Asarabacca.

Officinal.—The leaves.

FOLIA ASARI EUROPÆI. *Ed.* FOLIA ASARI. *Lond. Dub.*

THIS perennial plant is indigenous in England, although the dried roots are generally brought from the Levant. It grows in moist and shady situations. It produces only two leaves, which are reniform and very obtuse. The root is fibrous, of a grey-brown colour externally, but white within. Both the roots and leaves have a nauseous, bitter, acrimonious, hot taste; their smell is strong, and not very disagreeable.

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[*] *Syn.* Cabaret, Oreille d'homme, Nord sauvage, (*Fr.*) Haselkraut, (*Ger.*)

The root has been analyzed by MM. Lassaigne and Fenueille, who have found in it a concrete volatile oil, an emetic principle like cytisine, a greasy oil, citric acid, gum, and starch. Gorz, besides an etherial oil, also procured a camphoraceous matter by distilling the fresh root with water.

Med. use.—Before the discovery of America, and the introduction of ipecacuan into European practice, the root was one of the most common emetics. Given in substance from half a drachm to a drachm, it evacuates powerfully both upwards and downwards. It is said, that alcoholic tinctures possess both the emetic and cathartic virtues of the plant; that the extract obtained by inspissating these tinctures acts only by vomiting, and with great mildness; that an infusion in water proves cathartic, rarely emetic; that aqueous decoctions made by long boiling, and the watery extract, have no purgative or emetic quality, but prove good diaphoretics, diuretics and emmenagogues. It is now principally used as a sternutatory. The root of asarum is one of the strongest vegetable errhines; and is the active ingredient in most of the empirical *herb snuffs.* Drawn up the nostrils, in the quantity of a grain or two, it occasions a copious evacuation of mucus, and sneezing. The leaves are considerably milder, and may be used in the quantity of three, four, or five grains. Geoffroy relates, that after snuffing up a dose of this errhine at night, he has frequently observed the discharge from the nose to continue for three days together, and that he has known a paralysis of the mouth and tongue cured by one dose. He recommends this medicine in stubborn disorders of the head, proceeding from viscid tenacious matter, in palsies, and in soporific distempers.

Off. Prep.—Pulvis asari compositus, *D. E.*

ASPIDIUM FILIX MAS. *Lond. Ed. Dub.* Willd. *g.* 9621, *sp.* 94; Spr. *g.* 3267, *sp.* 119; Smith, *g.* 429, *sp.* 4.—Nat. ord. *Filices,* Linn. Juss.

Male fern. Male shield fern *.

Off.—The root.

RADIX ASPIDII FILICIS MARIS. *Ed. Dub.* RADIX FILICIS. *Lond.*

THE root of this fern is perennial, the frond annual, rising to the height of 1½ to 4 feet. It is indigenous, and frequent in woods, heaths, and stony places. The part which is officinal is the *caudex*, or subterraneous stem, and not the root, which consists entirely of radicles. The caudex is about a foot long, and the thickness of a writing quill, compressed, tortuous, tuberculous, and sending down fibrous radicles, covered with brown paleaceous scales; epidermis brown, or dark brown; parenchyme yellowish, more rarely reddish, fragile, striated, almost inodorous, with a nauseous sweet taste, but at last becoming rancid, slightly astringent and bitter.

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* *Syn.* Polypodium, (*Lat.*) Polypode commun ou de Chène, (*Fr.*) Süssfarren, Engelsüss, (*Ger.*) Felce Quercina, (*It.*)

M. Peschier of Geneva, who is quite convinced of the specific power of killing intestinal worms inherent in the male fern, points out a variety of causes to which occasional failures may be ascribed. This plant is only found in certain situations; and those who collect it for exportation gather for this purpose six species of fern, among which, in their dried state, it is very difficult to distinguish the genuine. The male fern is also very perishable, and in about two years becomes perfectly effete. Lastly, its power varies very much according to the season of the year when it is collected. In the spring the buds have a clean fracture, a white colour, and the mawkish smell of cucumbers: by drying they become brown, and lose more than three-fourths of their weight. In summer they are full, have a short fracture, a pistachio-green colour, and a nauseous smell; they do not change their appearance when dried in the open air, and they furnish about 50 grains *per* ounce of oleo-resinous product. Those collected in autumn, fresh or dry, have the same colour as in summer; but their fracture is thready, and their smell not half so strong and characteristic. In winter their green colour becomes yellow on drying, their fracture is fibrous; they have scarcely any taste and smell, and they do not furnish a fourth part of the active product compared with those gathered between the end of May and middle of September.

The fern root (caudex) was analyzed by M. Morin, who obtained a volatile oil, a fixed oil, composed of elaine and stearine, gallic and acetic acids, uncrystallizable sugar, tannin, starch, gelatinous substance insoluble in water and in alcohol, lignine, and ashes composed of subcarbonate and phosphate of lime, alumine, silex, and oxide of iron.

M. Peschier found that sulphuric ether extracted the active principle of the fern. The solution, left for some time at rest, yielded a mamellated substance, which, on being freed by pressure from the liquid with which it was impregnated, was found to be an adipocire. The liquid was, in consequence of its separation, thinner, had a greenish-brown colour, a disagreeable taste without being acrid, a nauseous smell, and reddened litmus paper. By further analysis, the whole products of the fern are, adipocire, a brown resin, an aromatic volatile oil, an aromatic virose fixed oil, a green colouring principle, a reddish-brown principle, extractive, muriate of potash and acetic acid.

Med. use.—The root was used as an anthelmintic in the days of Dioscorides. It gradually became neglected; but its use was again revived, at different times, by Madame Nuffer, Herrenschwand, and others, who frequently succeeded in killing and expelling the tapeworm, by the exhibition of secret remedies, of which the fern powder was the principal ingredient. To kill a tænia, about three drachms of the powder of fern are required. M. Peschier found that this quantity yielded 30 drops of oil, or 24 grains. This may be made into pills, or mixed up in the form of an emulsion; and as it is necessary to be given when the stomach is as empty as possible, one half may be given at night, and the other half in the morning, on the empty stomach. It is immaterial whether a purgative be given with it or not. By this method Dr Peschier assures us, that he had succeeded in 150 cases of tænia. Others have also given favourable reports; and M. Studer expelled, in one case, the *Tricocephalus dispar* of Bremser, which resists all known anthelmintics.

ASSAFŒTIDA. *Lond. Dub.* See FERULA.

ASTRAGALUS CRETICUS. De Candolle. *Astrologia. Dub.* ASTRAG. VERUS. Olivier, *Voy. dans l'Empire Ottoman.* ASTRAG. TRACAGANTHA. *Ed.*

Willd. *g.* 1379; Spr. *g.* 2589. *Diadelphia Decandria.*—Nat. ord. *Papilionaceæ,* Linn., *Leguminosæ,* Sect. *Papilionaceæ,* Juss.

Tragacanth shrub [*].

Off.—Gum Tragacanth.

ASTRAGALI TRAGACANTHÆ GUMMI, *ex variis astragali speciebus. Ed.* GUMMI TRAGACANTHA. *Dub.* TRAGACANTHA gummi. *Lond.*

AUTHORS are not agreed about the species of Astragalus which yields tragacanth. The London College has recognised the authority of Olivier upon the subject. After admitting that other species also yield this gum, he says, "The Astragalus, which appears to us the most common, and that from which almost all the tragacanth of commerce is derived, has not been described by any botanist." In a note upon the description, which it is unnecessary to insert, he characterises it as "*Astragalus verus*, fruticosus, foliolis villosis, setaceis, subulatis; floribus axillaribus, aggregatis, luteis."

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[*] *Syn.* Gum Dragon, (*Vulgar Eng.*) Gomm Adracant, (*Fr.*) Traganth, (*Ger.*) Draganti, (*It.*) Vādomocóttay pisin, (*Tam.*) Súmághulkătād Kasura, (*Arab.*) Katira, (*Hind. & Duk.*)

Dr Sibthorpe, in his *Flora Græca*, says, that the gum of the *Astr. aristatus* of Willd., the *Astr. sempervirens* of La Marck, the Τραγακανθα *Diosc.*, which grows very abundantly on Parnassus, and the mountains of the Peloponnesus and Thessalonica. and in the island of Cyprus, is exported daily to Italy. The same traveller states that the *Astr. Creticus*, the Ποτηριον *Diosc.*, which grows on Olympus, and the sandy hills of Ionia and Crete, also yields a species of tragacanth.

The celebrated Tournefort, in his travels in the Levant, saw tragacanth of fine quality abundantly produced by the *A. Creticus, sp.* 1. growing upon Mount Ida. An inferior kind is produced from the *A. gummifer, sp.* 10. upon Mount Libanus, according to Billardiere. The *A. tragacantha, sp.* 18, which grows at Marseilles, yields no gum; but Richard says that it seems to furnish it in warmer climates. The quantity of tragacanth furnished by Persia is very considerable. Much is consumed in that country in the manufacture of silk, and the preparation of comfits. It is exported to India, Bagdad, and Bussorah. Russia also gets some by the way of Bakou.

Tragacanth exudes naturally from July to September, either from wounds made in the shrub by animals, or from spontaneous fissures during the great heats of summer. According as the juice is more or less abundant, tragacanth exudes in tortuous filaments, vermicular, elongated, rounded, or compressed, rolled up upon itself, or twisted. The finest and purest tragacanth assumes this form. It is almost transparent, whitish, or of a yellowish white. It also exudes in large tears, which have more or less of the vermicular form. This is more of a reddish colour, and more contaminated with impurities. The gum sometimes adheres so strongly to the bark, as to bring away part of it in gathering it.

Tragacanth, though generally called a gum, differs very much from gum Arabic in its properties. It is opaque, white, difficultly pulverizable, unless when thoroughly dried, and the mortar heated, or in frost. Lewis correctly observes, that it cannot be properly said to be soluble in water; for, put into water, it absorbs a large proportion of that fluid, increasing immensely in volume, and forming with it a soft paste, rather than a fluid mucilage; and although it is easily diffused through a larger proportion of water, after standing a day or two, the mucilage subsides again, the supernatant fluid retaining little of the gum. The solution is adhesive, but cannot be drawn out into threads, and it moulds readily, acquiring a fetid smell. Besides these remarkable differences from gum Arabic in regard to brittleness, insolubility, and the quantity of water which it thickens, I find that tragacanth is not precipitated by silicated potass, and is precipitated by sulphate of copper, acetate of lead, and nitrate of mercury. It is totally insoluble in alcohol.

Med. use.—Tragacanth can only act as a demulcent; but on account of its insolubility, it is rarely given internally.

In pharmacy it is employed for forming powders into troches, and rendering tough cohesive substances, such as colocynth, pulverizable, by beating them with mucilage of tragacanth, and then drying the mass. For electuaries it is improper, as it renders them slimy on keeping. It is also an improper adjunct to active powders, as it swells up on attempting to mix them with water.

Off. Prep.—Mucilago astragali tragacanthæ, *E. D.* Pulv. tragacanthæ comp. *L.*

ATROPA BELLADONNA [*]. *Ed. Lond. Dub.*

Willd. *g.* 381, *sp.* 2; Spr. *g.* 751, *sp.* 8; Smith, *g.* 100, *sp.* 1.—*Pentandria Monogynia.*—Nat. ord. *Solanaceæ*, Linn., *Solaneæ*, Juss.

Deadly nightshade.

Off.—The leaf and root.

a. ATROPÆ BELLADONNÆ FOLIA. *Ed.* BELLADONNÆ FOLIA. *Lond. Dub.*

THE deadly nightshade is a herbaceous perennial plant, which is indigenous both in mountainous and woody situations, and sometimes cultivated in gardens. The whole plant is poisonous, especially the root; and the berries, which ripen in September, from their beautiful appearance, like black cherries, have sometimes proved fatal to children. The symptoms excited are, dryness of the mouth, trembling of the tongue, very distressing thirst, difficulty of swallowing, fruitless efforts to vomit, and great anxiety about the præcordia. Extravagant delirium then comes on, followed by sopor. The pupil remains dilated, and is not sensible even to the stimulus of light. The face becomes tumid, and of a dark red colour. The jaws are sometimes locked. Symptoms of irritation are rare, and never severe, but the narcotic symptoms last for several days. Fatal cases are uncommon. The body in such cases soon putrifies, swells, and becomes marked with livid spots; blood flows from the nose, mouth, and ears, and the stench is insufferable. On dissection the blood is found to be fluid, the intestines are inflated and inflamed, or eroded and grangrenous. The best method of cure is to excite vomiting as soon as possible, by emetics, and tickling the fauces; to evacuate the bowels by purgatives and glysters; and to give largely, vinegar, honey, milk, and oil. In some children who recovered by this treatment, the delirium was succeeded by a profound sopor, accompanied with subsultus tendinum; the face and hands became pale and cold, and the pulse small, hard, and quick. Their recovery was slow, and the blindness continued for a considerable time, but at last went off.

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[*] *Syn.* La belle dame, (*Fr.*) Die gemeine Wolffskirsche, Tollkirsche, (*Ger.*) La bella donna, (*It.*)

Mr Brandes urges the necessity of caution in the examination of atropia and its salts. Even the vapour of their solutions causes dilatation and paralysis of the pupil; and during the whole time of the experiments, Mr Brandes experienced violent headach, vertigo, pain of back, and nausea, so that he could scarcely continue them. On tasting a small quantity of sulphate of atropia, which was rather salt than bitter, he had extreme confusion of head, trembling in all his limbs, alternate rigors and heat, violent tension of the chest and dyspnœa, pulse weak, action of the heart scarcely perceptible, and at last retching. But the most severe of these symptoms abated in half an hour. A gentleman who lately graduated in this university had his health also injured by occupying himself in the preparation of atropia.

Melandri discovered in the leaves of the belladonna superoxalate of magnesia, also oxalate of lime, muriate of potass, a soft green resin, an animal extractive, mucus, and oxygenizable extractive. In the berries he found a colouring matter, a test of acids and alkalis almost as sensible as the tincture of the *Alcea purpurea.* If alcohol be poured upon the expressed juice of the ripe berries, the purple colour is at first precipitated along with the mucus. By carefully washing the coagulum with the same alcohol a tincture is obtained, which, diluted with alcohol until it has no sensible colour, becomes green with alkalies, and red with acids. After some time the purple tincture becomes yellow; but it still serves as a delicate test.

Vauquelin concluded from his analysis, that the juice of belladonna contained an animal (*azotiferous*) substance, which partly coagulated by heat, and partly remained in solution by the action of the free acetic acid present; a substance soluble in alcohol, of a bitter and nauseous taste, which by combination with tannin becomes insoluble, and furnishes ammonia by destructive distillation; several salts with potash for their base; nitrate, muriate, sulphate, superoxalate, and acetate. He ascertained by experiment that the principle soluble in alcohol produced the narcotic effects of the belladonna. It is, however, chiefly to Brandes that we are indebted for an accurate knowledge of the narcotic principle of belladonna.

He discovered in belladonna a new alkaloid, upon which its narcotic virtues depend. 2000 parts of the fresh plant yielded 506 of watery extract, 55 of extract by cold alcohol, and 60 by boiling alcohol, besides what was extracted by further manipulations. Its composition was very complex. It contained acids, (malic, oxalic, nitric, muriatic, phosphoric and sulphuric); bases, (atropia, potass, lime, magnesia and ammonia); gum, amylum, wax, green wax, pseudotoxia, vegetable gluten, and albumen. The atropia may be obtained separate, by making a decoction of belladonna, expressing the decoction, adding sulphuric acid as long as there is any precipitation, and, lastly, adding to the acid liquor a solution of potass as long as there is any precipitate, which is the atropia. The supernatant fluid is chiefly to be separated by careful decanting, and the last portion only to be put on a filter to be washed and dried. *Atropia* consists of very small brilliant transparent prisms of a dazzling white colour. It has no taste, although it seems to be more soluble in water than daturia or delphinia, although not so much so as picrotoxia. Cold alcohol does not act upon it, but boiling alcohol dissolves it, from which it separates on cooling. Æther and oil of turpentine do not act upon it, but warm almond oil dissolves a portion. With acids it forms soluble and crystallizable salts. It is superior in neutralizing power to all the other alkaloids; its sulphate containing only 39 of base, 36 of acid, and 25 of water, and its muriate 39.2 of base, 35.4 of acid, and 25.5 of water. Runge also made some observations on belladonna. He operated upon 400 lb. of the leaves. He precipitated the decoction by Goulard's solution of lead, filtered the mixture, precipitated the greater part of the lead by sulphuric acid, and the remainder by sulphuretted hydrogen. He evaporated the fluid to dryness, acted upon the extract with a mixture of one part of æther and four of alcohol, filtered the solution, evaporated and dissolved the extract in water. The solution (acetate of atropia) was pale yellow, and a single drop caused lasting dilatation of the pupil. When he decomposed the solution by lime water, the narcotic principle seemed to be decomposed, but not when he employed magnesia; and for this purpose he recommends, instead of the caustic magnesia commonly employed, the hydrate of magnesia got by precipitating sulphate of magnesia by solution of potass.

Med. use.—Yet this virulent poison, under proper management, may become an excellent remedy. Besides its narcotic power, it promotes all the excretions; but its exhibition requires the greatest caution; for it is apt, when continued for any length of time, even in small doses, to cause dryness and tension of the throat and neighbouring parts, vertigo, dimness of sight, and even temporary blindness. When any of these symptoms occur, its use must be suspended for some time, and afterwards resumed in smaller doses.

Deadly nightshade has been exhibited in several febrile diseases; as in obstinate intermittents; and in the plague: In inflammations; as the gout: In comatose diseases; as in palsy, and loss of speech from apoplexy: In spasmodic diseases; as in chorea, epilepsy, chincough, hydrophobia, melancholy, and mania: In cachectic affections; as in dropsies, and obstinate jaundice: In local diseases; as in amaurosis, ophthalmia, in scirrhus, and cancer: Dupuytren gives it internally in scrofulous ophthalmia and in *retinitis*: And, lastly, as an antidote to the contagion of scarlatina.

Hahnemann of Leipsic first asserted in 1807 the pretended power of belladonna in preventing the communication of scarlatina, and his statement has been supported by other German practitioners. M. Brera, professor at Padua, published in 1829 the results which he obtained by administering belladonna in large doses in cases of hydrophobia. According to Barbier, belladonna has not fulfilled in such cases the expectations of practitioners.

Deadly nightshade is best exhibited in substance, beginning with a very small dose of the powdered leaves or root, such as the fourth or eighth part of a grain for children, and one grain for adults, to be repeated daily, and gradually increased.

The watery infusion is also a powerful remedy. One scruple of the dried leaves is infused in ten ounces of warm water, and strained after cooling. At first two ounces of this may be given daily to adults, and gradually increased.

until the tension of the throat shews that it would be imprudent to go farther.

The watery extract is not a judicious preparation for internal use, on account of its great inequality. But Prof. Dierbach recommends a solution of three grains of the extract recently prepared from the expressed juice of the leaves, and with a very gentle heat, to be dissolved in an ounce of cinnamon water, as the most approved form, as a prophylactic in scarlatina. To a child of one year, three drops are to be given daily, and a drop to be added for each additional year of the child's age.

Externally, the powdered leaves are applied as a narcotic to diminish pain, and to cancerous and ill-conditioned sores. From its effect, in dilating the pupil for some time, Professor Reimarus proposed, and tried with success, the dropping a little of the infusion or solution of the extract into the eye, a few hours before performing the extraction of the cataract, with a view of facilitating the operation. It is now understood that a solution of the extract is the nostrum applied by Mr Williams, and other itinerant oculists, indiscriminately in all cases of blindness, and with wonderful effect, where the blindness depends upon opacity of the central portion of the lens. In such a case, under the care of Dr Hill of Greenock, a young lady was enabled to possess vision, by keeping the pupil dilated during the day, which required its application four times a-day. She had used it eight years, and its good effects rather increased than diminished. Dr Reisinger suggests the use of atropia instead of the extract of belladonna; and his experiments tend to prove that the insulated principle is merely narcotic or sedative, while the entire extract is at the same time considerably stimulant.

b. RADIX BELLADONNÆ. *Dub.*

THIS root is round, long, from one to several inches thick, branchy, sending out fibres from the branches; epidermis in the fresh root of a dirty yellow, in the dry root most commonly of a reddish brown; bark about a line thick, whiter and succulent; parenchyme in the fresh root fleshy and whitish, in the dry root of a pale yellow, fibrous, spongy and fragile, almost without smell, with a nauseous sweetish subaustere taste. It should be collected in the spring, and, being a more virulent poison than the leaves, kept shut up in glass bottles.

Fatal accidents have happened from this root having been eaten for parsnips. The only notice I find of the medicinal employment of the root is as a prophylactic against hydrophobia, given in powder, combined with calomel and cajeput oil. The dose given to persons of 13–15 years of age was 6 or 7 grains of the powder the first day, with an additional grain each day for 14 days. It is even asserted that a case of developed hydrophobia was cured by half a drachm of the powder and an ounce and a half of *Aq. Laurocerasi*, given in the course of seven hours, and repeated next day at longer intervals.

AVENA SATIVA *. *Ed. Lond. Dub.*

Willd. *g.* 142, *sp.* 13; Spr. *g.* 338, *sp.* 1. *Triandria Digynia.*—Nat. ord. *Gramina,* Linn., Juss.

Oats.

Off.—The husked seed, groats; and the meal.

a) SEMINA AVENÆ SATIVÆ. Semina decorticata. *Ed.*
SEMINA AVENÆ. Semina tunicis nudata. *Lond.*
b) FARINA AVENÆ SATIVÆ ex seminibus. *Ed. Dub.*

THIS is a well-known annual plant, which is very generally cultivated in northern countries, and in many places furnishes the principal subsistence of the people. When simply freed from the husks, this grain gets the name of groats, but it is more frequently ground into meal. Groats are made use of in broths. Oatmeal is baked with salt and water into cakes, or, with the same additions, is boiled to form porridge, two very important articles of food in this country. An infusion of the husks in water, allowed to remain till it becomes acidulous, is boiled down to jelly, which is called sowins. In all these forms it is nutritious, and easy of digestion.

Vauquelin found in the ashes of oats, phosphate of lime and silica.

Med. use.—Gruels or decoctions, either of groats or oatmeal, either plain, or acidified, or sweetened, form an excellent drink in febrile diseases, diarrhœa, dysentery, &c. and from their demulcent properties, prove useful in inflammatory disorders, coughs, hoarseness, roughness, and exulcerations of the fauces. Porridge made without salt is also frequently applied as a cataplasm to phlegmonous swellings, to promote their suppuration.

Off. Prep.—Pulvis pro cataplasmate, *D.*

AURANTII BACCÆ ET CORTEX. *Lond.* See CITRUS.

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* *Syn.* Avoine cultivée, (*Fr.*) Gemeine Hafer, zahmen Hafer, (*Ger.*) Vena volgare, (*It.*)

BALSAMUM CANADENSE. *Dub.* See PINUS.

BALSAMUM PERUVIANUM. *Lond.* See MYROXYLON.

BALSAMUM TOLUTANUM. *Lond.* See TOLUIFERA.

BARILLA. *Dub.* See SODÆ CARBONAS VENALE.

BARYTÆ CARBONAS*. *Ed.*
Carbonate of baryta. Witherite.

CARBONATED baryta is found in Lancashire, Cumberland, Scotland and Sweden, but is not common. It was first discovered by Dr Withering, and hence Werner gave it the name of Witherite. Its colour is greyish-white, sometimes inclining to milk white, and sometimes with a slight tinge of yellow, from a mixture of iron, seldom greenish, often invested with a red ochrey crust. It is found in solid masses, sometimes filling an entire vein, sometimes interspersed with sulphated baryta, frequently rounded, or affecting that form, seldom crystallized. Texture fibrous; fracture conchoidal; fragments, long splinters; specific gravity 4.3 to 4.338. Although it has no sensible taste, it is poisonous, and is employed to kill rats. In medicine it is only used for preparing the muriate of baryta.

Off. Prep.—Murias barytæ, *E.*

BARYTÆ SULPHAS. *Ed.*
Sulphate of baryta. Ponderous spar.

THIS earthy salt is found in great abundance. The foliated is in general the purest. Its specific gravity is from 4.4 to 4.865. It is insoluble in water. It is soluble in boiling concentrated sulphuric acid. It decrepitates when suddenly heated. By being formed into a thin cake with flour and water, and being afterwards heated to redness, it becomes phosphorescent. Heated to redness with charcoal, it is converted into a sulphuret, and it may be decomposed by the carbonates of potass and of soda.

Off. Prep.—Barytæ murias, *D. E.*

BELLADONNÆ FOLIA. *Lond.* See ATROPA.

BENZOINUM. *Lond.* See STYRAX.

BISMUTHUM. *Lond. Dub.*
Bismuth.

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* *Syn.* Spath pésant, (*Fr.*) Schwerspath, (*Ger*). Spato pesante, (*It.*).

Bismuth * is a rare metal, but occurs most frequently in a metallic state in Saxony, Sweden, France, and Cornwall.

Bismuth is white, slightly yellow, in large specular plates; pulverizable; specific gravity 9.822; moderately hard; sensible odour and taste, fusible at 460°, and volatile at a high temperature; oxidizable by heat and air; oxide vitrifiable into a greenish-yellow glass; readily dissolved by nitric acid, and by chlorine, also by boiling sulphuric acid; unites with sulphur. Oxide yellow, and colours glass of a greenish-yellow.

Bismuth is officinal only on account of the subnitrate prepared from it.

Off. Prep.—Bismuthi subnitras, *D. L.*

Bistortæ radix. *Lond.* See Polygonum.

Bitumen petroleum. *Ed.* Petroleum barbadense. *Dub.* Petroleum. *Lond.*

Rock oil. Barbadoes tar.

Bitumen is now employed as the generic name for several inflammable bodies of different degrees of consistency, from perfect fluidity to that of a brittle but very fusible solid, and of little specific gravity. They are insoluble in alcohol or in water, combine with essential oils and sulphur, decompose only a small proportion of nitrate of potass by deflagration, and on inflammation leave little or no residuum. Bitumen in its various states is found in various parts of the world, in the Tauride, Zante, Barbadoes, Trinidad, and Birmah.

Sp. 1. Naphtha. It is nearly as colourless, transparent, and fluid as water. Specific gravity 0.729 to 0.847, of a highly penetrating, yet not disagreeable smell, somewhat like that of rectified oil of amber, very volatile, and remaining fluid at zero of Fahrenheit.

Sp. 2. Petroleum. Not so fluid, transparent, or colourless, as the former; smell less pleasant. Specific gravity 0.878.

Sp. 3. Mineral tar. Viscid; of a dark colour; smell sometimes strong, but often faint. Specific gravity 1.1.

Sp. 4. Mineral pitch.—Maltha. Brittle in cold weather; of a dark colour; opaque. Specific gravity probably 1.07.

Sp. 5. Asphaltum. Very brittle; fracture conchoidal; glassy lustre; no smell unless when melted or heated. Specific gravity 1.07 to 1.65. Fusible and inflammable.

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* Marcasita, (*Lat.*) Bismuth pur, (*Fr.*) Reiner Wismuth, (*Ger.*) Bismout puro, (*It.*)

According to Mr Kirwan and Mr Hatchett, the first species, by exposure to the air, and gradual decomposition, passes successively through the intermediate states, till at last it is converted into asphaltum. When partially decomposed, the remaining naphtha may be separated by distillation from the superabundant charcoal.

The first species is very rare. It is found in Persia and in the Dutchy of Modena. The second is the officinal article, and comes from Barbadoes and other tropical islands.

Mr Swinton of Calcutta has lately sent to the Royal Society of Edinburgh some very fine petroleum from Birmah, where it may be had in great quantity, from which Dr Christison has got, by distillation, half its bulk of very fine naphtha.

Klaproth analyzed the asphaltum of Avlona in Albania. It occurs in thick beds, greyish black, breaks short, opaque, externally and internally moderately shining, lustre greasy; fracture imperfectly flat conchoidal; fragments sharp-edged; feels somewhat greasy; is soft, scissile, and light. Sp. gr. 1.205; burns with a strong and lively flame, and is considered to be the chief ingredient of the Greek fire. It is soluble in the oils and artificial naphtha. With sulphuric ether it forms a clear brown solution, which on evaporation leaves a brown-red thick extract. Absolute alcohol has no action upon it. The acids and boiling caustic ley do not dissolve it. By destructive distillation 100 grains yield 36 cubic inches of hydrocarbonate gas; 32 grains of bituminous oil; 6 of weak water of ammonia; 30 of charcoal; 7.5 of siliceous earth; 4.5 of alumina; 0.75 of lime; 1.25 oxide of iron; 0.5 of oxide of manganese.

The empyreumatic oil now obtained during the formation of coal gas in great abundance, agrees in every respect with the native fluid bitumen, and by rectification it is rendered equally light, limpid and colourless as naphtha, for which it is used as a substitute, particularly for dissolving caoutchouc, for forming surgical instruments, and to render cloth waterproof. It is also burnt instead of alcohol in lamps for heating small vessels.

Med. use.—The Barbadoes tar is found in several of the West India islands, where it is highly esteemed by the inhabitants as a sudorific and in disorders of the breast and lungs; though in cases of this kind, attended with inflammation, it is certainly improper; they likewise apply it externally as a discutient, and for preventing paralytic disorders.

An oil extracted from a kind of stone coal has been extolled among the common people, under the name of British oil, for rheumatic pains, &c.

The celebrated Egyptian mummies were impregnated with a solution of asphaltum. This substance is also supposed to have been the principal ingredient in the Greek fire. It was the basis of the varnish which Stradivarius used for his violins. One part of asphaltum, dissolved without heat in five parts of rectified petroleum, gives a blackish-brown liquor, which, when dried with care, leaves the asphaltum in the form of a black shining varnish.

BOLETUS IGNIARIUS *. *Ed.*

Spr. *g.* 3473, *sp.* 82.—*Cryptogamia, Fungi.*—Nat. ord. *Fungi*, Linn., Juss.

Female agaric, or Agaric of the oak, called, from its being very easily inflammable, Touchwood or Spunk.

THIS fungus is indigenous, and is frequently met with on the oak, and also on the birch, beech, elm, hornbeam, ash, walnut. That of the oak is preferable. According to Bulliard, it is the *Boletus ungulatus*, and not the *B. igniarius*, which is employed in making the German tinder, *Amadou*. It is also called *Polyporus fomentarius* by Fries and some other cryptogamists. This boletus, whilst young, has the flesh thready and soft. It is best when gathered in August or September.

It is variously prepared for use. The outer coat is removed by means of a knife, and the spongy yellowish substance beneath is cut into thin slices, and beat with a mallet to soften them, until they can be easily torn into pieces, in which state it is employed for surgical purposes. To fit it for tinder it is boiled in a solution of nitre or of gunpowder, then dried, and beat anew. Some writers recommend the use of chlorate of potass instead of nitre, which causes it to burn faster. It was analyzed by Bouillon Lagrange, who found it to contain an extractive; a very small quantity of resin; a small quantity of animal matter, muriate of potass, sulphate of lime; and by incineration it yielded phosphate of lime, phosphate of magnesia, and iron. Prepared without nitre, and applied externally, it has been much celebrated as a styptic, and said to restrain not only venous but arterial hæmorrhagies, without the use of ligatures. It does not appear, however, to have any real styptic power, or to act otherwise than dry lint, sponge, or any other soft, porous application. Prepared with nitre as for tinder, it has been used as a species of moxa.

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* *Syn.* Amadouvier, Agaric de Chène, (*Fr.*) Feuerschwamm, (*Ger.*) Esca, (*It.*) Garikoon, (*Tam.*) Agārikun, (*Arab. & Duk.*)

BONPLANDIA TRIFOLIATA. *Ed. Dub.* CUSPARIA FEBRIFUGA. *Lond.*

Spr. *g.* 856, *sp.* 1. *Pentandria Monogynia.*—Ord. naturalis, *Rutaceæ*, Jussieu.

Off.—The bark, called Angustura bark.

CORTEX BONPLANDIÆ TRIFOLIATÆ. *Ed. Dub.* CORTEX CUSPARIÆ. *Lond.*

THE natural history of this bark was long but imperfectly known. It is now fully established that it is the bark of a tree indigenous in South America. Willdenow, from a dried specimen, referred it to a new genus, which he called BONPLANDIA, in honour of Humboldt's botanical friend. The London College, however, give this tree the name of *Cusparia febrifuga*, inserted by Humboldt in the chart belonging to his geography of plants, but that of *Bonplandia trifoliata* is adopted by him in his *Plantæ Æquinoctiales.* The name Angustura bark is derived from the Spanish denomination *cascarilla*, or *corteza del Angostura*, which is the vulgar name of the town of St Thomas, near the straits of the Orinoco, where it forms a considerable article of commerce.

The accuracy of the preceding account, which rests on the authority of Humboldt and Bonpland, has been lately called in question by Dr Hancock, whose residence for some time in the missions of Carony, and frequent examination of the bark and tree on the spot, entitle his remarks to the consideration of medical botanists.

According to him, there are but two stamina, and the tree belongs to *Diandria Monogynia*, and is a species of the genus of *Galipea* of Aublet, to which Humboldt's species had been already referred by St Hilaire and De Candolle, under the name of *Galipea cusparia*; but Dr Hancock proposes that it should be called *G. officinalis*, and gives the following character of the species: "Foliis 3–foliolatis, racemis pedunculatis, axillaribus et terminalibus; calyce 5–dentato; staminibus 2; nectariis 5; (staminibus sterilibus?") The tree which Humboldt described was a majestic forest tree, from 60 to 80 feet high, whereas that of Dr H. never exceeded 20, the medium being 12 or 15 feet, and the diameter of the trunk, which is tolerably erect, is from 3 to 5 inches: This accords with the appearance of the bark, which is never that of a larger trunk. The leaves, when recent, have a strong odour resembling that of tobacco, whence its name of *Orayuri* among the aborigines. The bark on the tree is smooth and externally grey.

The appearance of the bark varies, according as it has been taken from larger or smaller branches. It is only one or two lines in thickness, and is sometimes cracked externally. The outer surface is more or less wrinkled, and of a greyish colour, marked with a great variety of parasitical cryptogames, and the inner surface is of a dull brown. The bark of the younger branches is of a fine green colour, dotted with greyish tubercles. Its substance is of a yellowish-brown colour. Its fracture is short and resinous. Its taste is intensely bitter, and slightly aromatic, leaving a strong sense of heat and pungency in the throat and fauces. The odour is peculiar. The powder is yellow.

According to the experiments related by Mr Brande, from 3840 parts of angustura, there were extracted by alcohol, 144 of resin, and 300 of an acrid unctuous substance; the residuum yielded to water 1500 of dry gummy extract. Treated first with water, it gave 2110 grains of a clear brown extract, bitter, but not acrid, and afterwards 161 of a resin of a light brown colour, and extremely acrid. By distillation it gave 26 of essential oil. The tincture is of a deep yellow colour, reddens infusion of turnsole, and becomes turbid and white on admixture with water. By repeated filtration a brownish resin is separated, and the transparent fluid has a pale yellow colour. I find that it is precipitated by infusion of galls, but not by solution of gelatine, and it has the peculiar property of acquiring a deep red colour with red sulphate of iron, and depositing a purplish slate-coloured precipitate, remarkably different from what I have seen any other substance produce. Vauquelin says this precipitate is yellow; but in every other respect his analysis, as well as the subsequent one of Dr A. T. Thomson, confirms mine.

Med. use.—As an aromatic bitter, it acts as a tonic and stimulant of the organs of digestion. It increases the appetite for food, removes flatulence and acidity arising from dyspepsia, and is a very effectual remedy in diarrhœa proceeding from weakness of the bowels, and in dysentery; and it possesses the singular advantage of not oppressing the stomach, as cinchona is apt to do. It does not cure intermittents.

It is exhibited, 1. In powder, in doses of from 5 to 20 grains, either alone or with rhubarb, magnesia, or carbonate of lime. 2. In infusion: the infusion of one drachm in four ounces of water may be used daily. 3. In tincture: one or two drachms in dyspepsia. 4. In watery extract. Humboldt informs us, that the Catalonian Capuchins, who possess the missions of Carony, prepare with great care an extract of this bark, which they distribute to the convents of Catalonia. Dr Hancock, however, says that he found it much inferior to the fresh bark or its recent infusion. He gave chiefly a fermented infusion, as it is administered by the natives. Into a large jug, containing about six gallons, there is put one pound of coarsely powdered bark, with an equal quantity of brown sugar. The jug is then filled with water, and about four ounces of wheaten bread added to promote fermentation. It is then stopped close, placed in the sun, and shaken frequently. As soon as the fermentation is well begun, it is considered fit for use, and is administered in doses of from four to six ounces, three or four times a-day.

Dr Hancock found it to be greatly superior to cinchona, in a very malignant bilious intermittent fever, which proved fatal to the inhabitants as well as foreigners at St Thomas de Angustura in 1816-7, the irregular paroxysms of fever being suspended on the second or third day after commencing its use. It was also remarkably beneficial in dropsy, which was there very prevalent, and in dysentery, conjoined with Dover's powders. The native doctors give the infusion warm to induce sweat and diuresis, and begin with so large a dose as to evacuate the stomach or bowels. They likewise employ a decoction of the leaves as a bath in fever, and pains of the limbs arising from cold, or chronic rheumatism. The bruised bark is used to intoxicate fishes.

Off. Prep.—Tinctura Bonplandiæ trifoliatæ, *E.* T. Angusturæ, *D.*

ANGUSTURA SPURIA.

Dr RAMBACH of Hamburgh first observed poisonous effects from some bark sold under the name of Angustura, and his observations have been fully confirmed by other accidents and by experiments on animals. The Austrian Government, on this account, ordered all the angustura bark in the kingdom to be destroyed, and interdicted its future importation; and other states have followed its example.

The spurious angustura belongs to the same class of poisons as the Faba Sti Ignatii, Nux vomica, and upas tieuté. The tree, from which it is obtained, is not yet known, but it is a native of South America, and therefore is not, as formerly asserted, the bark of the *Brucea antidysenterica,* which grows in Abyssinia.

The appearance of the genuine and spurious angustura bark, is so different, that I agree with M. Fee in being surprised that they could ever be mistaken for each other. The most obvious distinctions have been contrasted by him.

GENUINE.	SPURIOUS.
Smell; strong and disagreeable.	*Smell;* none.
Taste; bitter, durable, pungent.	*Taste;* insupportably bitter, excessively durable.
Epidermis; supporting a multitude of lichens of different genera, having a membranous yellowish crust.	*Epidermis;* almost always clean, and very rarely covered with lichens.
Softens in water, and imbibes it quickly.	Does not soften sensibly in water.
Exuberance whitish, spongy and insipid, sometimes covering the epidermis, and not changing colour from nitric acid.	Exuberance of a fine rust colour, covering the epidermis, and having the general properties of the bark, and acquiring an intense green colour from the contact of nitric acid.
Very light, tissue not compact.	Very heavy, tissue compact.
Fracture resinous, shining.	Fracture dull and blackish.
Thickness $\frac{1}{4}$th to $\frac{3}{4}$ths of a line, rarely a line.	Thickness never less than a line, sometimes as much as two.
Substance of the bark yellowish, and may be detached in lamellæ.	Substance, brown, smooth, not composed of lamellæ.
Easily penetrated by cutting instruments.	Very difficultly penetrated by cutting instruments.

It is also very evident, that the genuine angustura has been sliced off from the wood by a cutting instrument, as its edges are often bevelled; whereas the spurious has been torn off when the sap was rising. M. Planche gave a minute contrast of the action of reagents upon their infusions, which is also different, and M. Guibourt has prosecuted the subject.

The false angustura has been analyzed by Pelletier and Caventou. They have discovered in it a new alkali upon which its virulence depends, and to which they have given the name of *Brucea.* When obtained pure it crystallizes in oblique prisms, with parallelogram bases, or in talcy plates somewhat like boracic acid. It is soluble in 500 waters boiling, and in 850 cold. It is also soluble in alcohol, but not in sulphuric ether, or the fixed oils, and very little in the volatile oils. Its action on the living body is to produce tetanus, without affecting the intellectual faculties, in which respect it has a great analogy to *strychnia,* but it is only about one-twelfth of its strength. It forms salts and supersalts, with many acids, which are generally soluble.

BORAX. *Dub.* *See* SODÆ BORAS.

BOSWELLIA SERRATA. Roxburgh. *Dub.* [*].

Spr. *g.* 1560, *sp.* 1. *Thurifera.* *Decandria Monogynia.*—Nat. ord. *Miscellaneæ*, Linn., *Terebinthaceæ*, Juss.

Off.—The gum-resin [†].

GUMMI-RESINA BOSWELLIÆ SERRATÆ. *Dub.*

Mr COLEBROKE has shewn that it yields the frankincense of the ancients. He found it abundant near Nagpur; and ascertained, by personal observation, that the exuding resin was collected and sent by the East India Company to England, where it was sold as *Frankincense*, and is undoubtedly the substance commonly known under the name of *Olibanum.*

The East Indian frankincense occurs in various forms, of which many are in tears. They are whitish or yellowish, powdery externally from friction, very brittle, internally pellucid, smell balsamic and resinous, taste acrid and somewhat bitter. It burns with a clear flame, and an agreeable smell.

Olibanum is almost entirely soluble in alcohol, sp. gr. 1.221. Braconnot got in 100, 56 resin, 30 gum, 6 glutinous matter, 5 pale yellow volatile oil, having a citron smell.

It is used only for fumigations and plasters.

BUBON GALBANUM. *Ed. Dub. Lond.*

Willd. *g.* 546, *sp.* 2.—*Pentandria Digynia.*—Nat. ord. *Umbellatæ*, Linn., Juss.

Off.—The gum resin called Galbanum [‡].

GUMMI RESINA BUBONIS GALBANI. *Ed.* GALBANUM; gummi resina. *Dub.* GUMMI RESINA GALBANI. *Lond.*

THIS plant is the *Selinum Galbanum* of Spr. *g.* 1081, *sp.* 13, perennial, and indigenous in Africa. It abounds with a milky juice, which sometimes exudes from the joints of the old plants, but is more frequently obtained by cutting them across, some inches above the root. The juice, which flows from the wound, soon hardens, and is the galbanum which is brought to us from Syria and the Levant. It is also imported into Bombay from the Cape of Good Hope or Syria, to be transmitted to China.

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[*] *See* Juniperus Lycus.

[†] *Syn.* Λίβανος, (*Gr.*) Thus, (*Lat.*) Encens, (*Fr.*) Weyrauch, (*Ger.*) Incenso, (*It.*) Koondricum, (*Tam.*) Coondoor, (*Duk.*) Coonder, (*Pers.*) Koondoorooskum, (*Tel.*) Bistuj, (*Arab.*) Hoonda googool, (*Cyng.*) Kŭndŭ, (*Sans.*)

[‡] *Syn.* Γαλϐάνη or μετώπιον, (*Gr.*) Galbanum, (*Fr.*) Mutterharz, (*Ger.*) Galbano, (*It.*) Beersud, (*Pers.*) Barzud, (*Arab.*) Bireeja, (*Hind.*)

The best sort of galbanum consists of pale-coloured pieces, about the size of a hazel nut, which, on being broken, appear to be composed of clear white tears, of a bitterish acrid taste and a strong disagreeable smell, not at all alliaceous, in which respect it differs from sagapenum. But it most commonly occurs in agglutinated masses, composed of yellowish or reddish and clear white tears, which may be easily torn asunder, of the consistence of firm wax, softening by heat, and becoming brittle by cold, mixed with seeds and leaves. What is mixed with sand, earth, and other impurities, and is of a brown or blackish colour, interspersed with no white grains, of a weak smell, and of a consistence always soft, is bad.

Galbanum is almost entirely diffusible in water, but the solution is milky; nor does wine or vinegar dissolve it perfectly. It is not fusible, but it furnishes a considerable proportion of essential oil when distilled with water. Neumann obtained from a pound of galbanum by distillation with water six drachms of oil, besides what remained dissolved in the water. The watery extract amounted to about three ounces. It was somewhat nauseous, but could not have been recognised as a preparation of galbanum. From the same quantity alcohol extracted upwards of nine ounces and a half of a hard, brittle, insipid, inodorous substance (resin ?) Its constituent principles, according to M. Pelletier, are, resin, 66.86 ; gum, 19.28; wood and impurities, 7.52; volatile oil and loss, 6.34 ; super-malate of lime, some traces. A volatile oil, of a fine indigo blue, is obtained by cautious distillation from galbanum, which preserves this colour in alcohol; neither acids nor alkalies change it.

Med. use.—From the quantity of volatile oil which it contains, galbanum is considered as the most stimulating of the gum resins. It has been chiefly recommended in chronic mucous fluxes, as chronic cattarh, or humoral asthma, in retention of the menstrual discharge, and in chronic rheumatisms. Externally, it is sometimes employed as a discutient or digestive application, and in solution as a stimulant in rheumatic pains. A watery solution has been used in atonic ophthalmia. The dose may be from 5 to 15 grains, two or three times a-day.

Off. Prep.—Pil. galb. comp. *L. D.* Pil. assæfœtidæ comp. *E.* Tinct. galbani, *D.* Emplast. galbani, *D.* Empl. galb. comp. *L.* Empl. gummosum, *E.* Empl. assafœtid. *E.*

CAJUPUTI OLEUM. *Lond.* See MELALEUCA.

CALAMINA. *Lond. Dub.* See ZINCUM.

CALAMI RADIX. *Lond.* See ACORUS.

CALUMBA. *Lond.* See COLUMBO.

CALX, recens usta [*]. *Dub. Ed.*
Quicklime recently burnt.

LIME is not found in nature uncombined, but it is easily prepared from any of its carbonates, either mineral or animal, by the action of fire, which first expels the water, then destroys any animal matters which may be present, and lastly expels the carbonic acid. This process is improperly termed the burning of lime. The product is lime, or, as it is commonly called, quicklime. In this state lime is of a grey-white colour, warm, acrid and urinous to the taste; sp. gr. 2.33, soluble in 777.7 times its weight of water. It is apyrous; it changes vegetable blues to green; it combines with all the acids, sulphur, sulphuretted hydrogen, and phosphorus; it is very abundant in the mineral kingdom, and forms the basis of animal bones and shells. The calcareous spars, marble, limestone, chalk and marl, consist chiefly of lime.

If about one-third of its weight of water be poured upon lime, a great increase of temperature takes place, steam is produced, and the lime crumbles down into a dry powder, increased in weight by the presence of part of the water which has been solidified by the lime: and to the caloric of fluidity, which is expelled during the conversion of the water into a solid, the great increase of the temperature is owing. Lime in this state is said to be slacked. If more water be poured upon slacked lime, there is no new evolution of caloric; but if the water amount to 800 times the weight of the lime, the lime is completely dissolved. The solution is termed Lime-water.

As lime quickly attracts moisture and carbonic acid from the atmosphere, it should be always recently burnt; and it should be preserved in very close bottles. It will also keep for a considerable time in the state of hydrate, if covered with water. The crust of carbonate of lime formed preserves the lime below in a caustic state. Lime should not effervesce with acids, and should be entirely soluble in water.

Med. use.—On the living body lime acts as an escharotic, and as such it was formerly applied to ill-conditioned and obstinate sores; but it is chiefly used dissolved in water, and in pharmacy.

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[*] *Syn.* Chaux, (*Fr.*) Kalk, (*Ger.*) Calce, (*It.*) Chunāmboo, (*Tam.*) Hoonoo, (*Cyng.*) Chūnna, (*Hind. & Duk.*) Capoor, (*Mal.*) Soonum, (*Tel.*) Chūrna, (*Sans.*) Nooreh, (*Pers.*) Ahak, (*Arab.*).

Off. Prep.—Aqua calcis, *E. D.* Liquor calcis, *L.* Potassa cum calce, *L. E.* Potassæ causticæ aqua, *D.* Aqua potassæ, *E.* Liquor potassæ, *L.* Ammoniæ causticæ aqua, *D.* Aqua ammoniæ, *E.* Liquor ammoniæ, *L.* Alcohol ammoniatum, *E.* Acidum benzoicum, *D.*

CALCIS CARBONAS.
Carbonate of lime.

CARBONATE of lime is obtained from both the mineral and animal kingdoms. It is found under a great variety of forms, and has various names, as chalk, limestone, marble, spar. In form it is either amorphous, stalactical, or crystallized. When amorphous, its texture is either foliated, striated, granular, or earthy. The primitive form of its crystals is a rhomboidal parallelopiped. Hardness, lustre, and transparency, various: when transparent, it causes double refraction; specific gravity from 2.315 to 2.78; colour, when pure, white; effervesces briskly with muriatic acid, and dissolves in it entirely, or nearly so, forming a colourless solution.

The officinal varieties of mineral carbonate of lime are,

a) CRETA ALBA, Carbonas calcis mollior. *Ed. Dub.*
CRETA, Carbonas calcis friabilis. *Lond.*
Soft carbonate of lime. Chalk[*].

Off. Prep.—Creta præparata, *D. L.* Carbonas calcis præparatus, *E.* Subcarbonas ammoniæ, *E.*

b) MARMOR ALBUM, Carbonas calcis durior. *Ed. Dub.*
MARMOR ALBUM, Carbonas calcis dura. *Lond.*
Hard carbonate of lime. Marble[†].

Off. Prep.—Solutio muriatis calcis, *E.* Ammoniæ bicarbonas, *D.* Sodæ bicarbonas, *D.* Aqua carbonatis sodæ acidula, *D.* Aqua supercarbonatis sodæ, *E.* Potassæ bicarbonas, *D.* Aqua supercarbonatis potassæ, *E.*

They contain about 45 parts of carbonic acid, and 55 of lime.

Carbonate of lime occurs in the animal kingdom in the shells and rudiments of the shells of some of the crustaceous insects. Of these some are still officinal, *Crabs claws*, and *Crabs stones*, vulgarly called crabs eyes, and *Oyster shells.*

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[*] *Syn.* Craie blanche, (*Fr.*) Waisse kreide, (*Ger.*) Creta alba, (*It.*) Simic chúnámboo, (*Tam.*) Velāitie chunna, (*Duk.*) Sima soonum, (*Tel.*) Tyn abyaz, (*Arab.*) Gil sifid, (*Pers.*) Khurrie muttie, (*Hind.*) Ratta hoonoo, (*Cyn.*) Capoor engrecs, (*Malay.*)

[†] *Syn.* Le marbre, (*Fr.*) Der Marmor, (*Ger.*) Il marmo, (*It.*)

c) CHELÆ CANCRORUM ex cancro paguro. *Ed.*
Crabs claws from the black-clawed crab.

THE species of crab which furnishes this article inhabits the North Sea. Its claws are yellow, tipt with black.

They consist of carbonate of lime, combined with a little phosphate of lime and gelatine. The quantity of the two last is too small, and their action on the human body too inconsiderable, to make any considerable difference in medical properties between these concretions and carbonate of lime, as it occurs in the mineral kingdom.

d) LAPILLI CANCRORUM ex cancro astacho *. *Ed.*

CRABS STONES are generally about the size of peas, or larger; somewhat hemispherical in their shape, and laminated in their texture; of a white colour, but sometimes reddish or bluish.

These concretions are found in the stomach of the craw-fish, one on each side, at the time when the animal changes its shell, which commonly happens in the month of August. The concretions afterwards gradually disappear, and none are found after the new shell has acquired its full degree of firmness. They therefore seem to furnish the materials for the formation of the new shell. The craw-fish is found in this country, especially in England and in the rivers and lakes of Europe in general; but the concretions are brought in great numbers from Poland and Russia, especially from the province of Astracan, where the craw-fish are either bruised with wooden mallets, or laid up in heaps to putrefy, when the flesh is washed away with water, and the concretions picked out.

Crabs stones are said by most writers on the materia medica to be frequently counterfeited with tobacco-pipe clay, or compositions of chalk with mucilaginous substances. This piece of fraud, if really practised, may be very easily discovered: the counterfeits wanting the leafy texture, which is observed upon breaking the genuine; more readily imbibing water; adhering to the tongue; and dissolving in vinegar, or the stronger acids, diluted with water, either entirely or not at all, or by piece-meal; whilst the true crab stones, digested in these liquors, become soft and transparent, their original form remaining the same, as the organization of the gelatine is not altered by the acid.

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* *Syn.* Astacus fluviatilis *Fabricii,* Ecrevisse, (*Fr.*) Flusskrebs, (*Ger.*) Granchio, (*It.*)

e) TESTÆ ex ostrea eduli. *Lond.*
Oyster-shells.

THE oyster is a very nutritious article of diet, and in some diseases not only admissible, but even advantageous. Their shells, which are officinal, are composed, like all other mother-of-pearl shells, of alternate layers of carbonate of lime, and a thin membranous substance, which resembles coagulated albumen in its properties. By burning, this membrane is destroyed, and the shells are converted into very pure lime.

Med. use.—These varieties of carbonate of lime differ only in the compactness of their aggregation. The harder kinds are fitter for some pharmaceutical purposes, as for the gradual production of carbonic acid gas and solution in muriatic acid; while the friable varieties are fitter for medical use. Chalk and crabs stones are often exhibited internally to correct acidity of the stomach when accompanied by looseness; and prepared chalk forms an excellent application to scalds and burns and fetid ulcers, to absorb the serum and pus effused.

Off. Prep.—Testæ præparatæ, *L.*

CAMBOGIA. *Lond.* See STALAGMITIS.

CAMPHORA* ex lauro camphora. *Ed.* CAMPHORA, laurus camphor, concretum sui generis sublimatione paratum. *Lond.* CAMPHORA. *Dub.* See LAURUS and DRYABALANOPS.

Camphor.

BY far the greater part, I may say the whole, of the camphor of European commerce is obtained from the *Laurus camphora*, and to this species of camphor the characters of that vegetable principle, as given in systems of chemistry, refer. Every part of the tree smells strongly of camphor, which is obtained from the trunk, branches, and root, by sublimation. The wood is cut down into small pieces, and put into a still, with a proportion of water. After the water has been kept boiling forty-eight hours, the camphor is found adhering to the straw with which the head of the still is lined. In this state it is imported by the Dutch, and is called *crude camphor*. It is very impure, consisting of small brownish or dirty grey grains, mixed with straw, wood, hair, and other impurities. From these it is purified, in Holland, by a second sublimation in glass vessels; being previously mixed with quicklime, to combine with and prevent any empyreumatic oil with which it may be contaminated from subliming, while the camphor concretes in the upper part of the vessel into cakes, convex on the one side, and concave on the other, about two or three inches thick, thinner at the edges, and generally perforated in the middle.

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* *Syn.* Canfre, (*Fr.*) Kampfer, (*Ger.*) Canfora, (*It.*) Cárpoorum, Soodun, (*Tam.*) Càpooroo, (*Cyng.*) Kàfoor, (*Arab. Pers.*) Kaafour, (*Malay.*) Kupoor, (*Hind.*) Kàpur, (*Bali.*)

Pure camphor is lighter than water, very white, pellucid, somewhat unctuous to the touch, brittle, yet tough and elastic, so as to be scarcely pulverizable; shining in its fracture, and crystalline in its texture; of a bitterish, aromatic, pungent taste, yet accompanied with a sense of coolness, of a strong and very penetrating smell; very volatile, inflammable, burning entirely away, without leaving any coal or ashes; capable of combining with the resins and balsams, soluble in alcohol, ether, fixed and volatile oils, and the concentrated sulphuric, nitric, muriatic and acetic acids, and in ammonia; separable from these alcoholic and acid solutions by water; insoluble in water, alkalies, and the weaker acids; decomposed by heat, when mixed with alumina, into an essential oil and charcoal; and by treating it with a sufficient quantity of nitric acid, forming a portion of camphoric acid; and, with sulphuric acid, artificial tannin.

But the production of camphor is not confined to the laurus camphora, although it furnishes almost all the camphor of commerce; it is found in very great purity concreted among the woody fibres of the *Dryabalanops camphora* of Borneo and Sumatra. The most minute description of the solid camphor of Borneo is given by Dörrffurt and Schwartze, taken from John Crawford of Demerary,—an authority I have not been able to trace. It is said to be stronger than laurel camphor, and more fixed; to be opaque, of a chalk-white colour, friable between the fingers, of a not unpleasant taste, first cooling and then heating, and emitting when refined a distinct violet smell; and that a small portion is soluble in water, and the rest consists of pure volatile oil. The specimen examined by me does not altogether coincide with this description. It occurs in tabular plates somewhat translucent. It is easily pulverizable without the addition of alcohol, and the powder does not agglutinate on standing, whereas that of laurel camphor does. It is evidently more compact than common camphor, emitting a ringing sound when the bottle containing it is shaked. Its specific gravity is hardly less than that of water; some portions even sink. It does not at all sublime spontaneously, nor does it form crystals in the upper part of the bottle in which it is kept. When boiled with water its smell is disseminated, and it wastes. Its other characters do not differ from those of common camphor. From the same tree is also obtained, in considerable quantity, a limpid fluid. The fluid camphor is transparent, of a pale yellowish colour, smelling like a solution of camphor in oil of turpentine, and of a bitter turpentine taste. To the touch it is slightly viscid, and has not the harshness of oil of turpentine. Its specific gravity at 60° is 887. Exposed to the air on a watch-glass, it was reduced, after standing a month, to one-tenth of its original weight, became a clammy transparent homogeneous fluid of a very pale brown colour, and resembling in smell as well as consistence Canada balsam, but without any odour of camphor. This residuum seemed to be soluble in ether, and partially in cold alcohol, but on the application of heat it was totally dissolved. Fluid camphor, when agitated with water, formed a whey-coloured mixture, which gradually separated into a transparent supernatant portion, and a milky inferior fluid, but not nearly so quickly as oil of turpentine and water separate. Its distillation with water is liable to the same difficulty as the distillation of oil of turpentine, from the explosions which blow over into the neck of the retort a part of the mixture; but in the receiver I got a watery fluid, with some oil, and a white opaque pellicle like camphor. The liquor in the retort gradually acquired a gelatinous appearance, and, on standing, was found to consist of a watery fluid, and abundant white curdy like substance, which floated in the fluid. For specimens of both solid and fluid camphor of Borneo, I am indebted to John Crawford, Esq. resident at Sincapore.

Camphor is also contained in the roots of the laurus cinnamomum, alpinia galanga, amomum zedoaria, &c.; in the seeds of the amomum cardamomum, piper cubeba, &c.; and in many indigenous plants, as in the thymus serpyllum and vulgaris, juniperus communis, rosmarinus officinalis, salvia officinalis, mentha piperita, &c. and it may be separated from the essential oils of rosemary, spike, marjoram, and sage.

An artificial camphor, differing from common camphor, in not being soluble in weak nitric acid, nor being precipitated by water from its solution in strong nitric acid, may also be prepared, by directing a stream of muriatic acid gas into oil of turpentine. Camphor is now universally considered to be a peculiar vegetable principle.

Med. use.—Camphor is a very active substance, when taken into the stomach. It increases the heat of the body considerably, and gives a tendency to diaphoresis, but without quickening the pulse. At first it raises the spirits, but produces a subsequent depression. In excessive doses it causes syncope, anxiety, retchings, convulsions and delirium. In three cases these effects were produced by 30 or 40 grains taken at once; and in another, the patient recovered after taking 160 grains dissolved in alcohol. No fatal case of poisoning of man by camphor has been recorded, but in animals the heart is found to be not contractile, the stomach and intestines inflamed, or dotted with black spots, the ureters, urethra and spermatic cord inflamed. These violent effects of camphor are most effectually counteracted by opium.

In a morbid state of the body, camphor allays inordinate actions. When the pulse is hard and contracted, it renders it fuller and softer. It removes spasms, and flitting pains arising from spasms; and in delirium, when opium fails of procuring sleep, camphor will often succeed. It is also said to correct the bad effects of opium, mezereon, cantharides, and the drastic purgatives and diuretics.

The most general indication for the use of camphor is the languor or oppression of the *vis vitæ.* It may therefore be given with advantage in all febrile diseases of the typhoid kind, especially when attended with delirium; in inflammations with typhoid fever, as in some cases of peripneumonia and rheumatism; in eruptive diseases, to favour the eruption, or to bring it back to the skin, if from any cause it has suddenly receded, as in small-pox, measles, &c.; in many spasmodic diseases, especially mania, melancholy, epilepsy, hysteria, chorea, hiccough, &c.; in indolent local inflammations, not depending upon an internal cause, to excite action in that part.

As, from its great lightness, it is apt to swim upon the contents of the stomach, and to occasion pain at its upper orifice, it is necessary that it be always exhibited in a state of minute division. In order to reduce it to powder, it must be previously moistened with a little alcohol. It may then be given, in powder, with sugar, magnesia, and nitrate of potass; in pills, with the fetid gums and mucilage; in solution, in alcohol, oil, or acetic acid, or suspended in the form of an emulsion, by means of starch, mucilage, sugar, yolk of egg, almonds, vinegar, &c. It may be exhibited in small doses, or from one to five grains, repeated at short intervals, as its effects are very transient; or in large doses, of 20 grains and upwards.

Externally, it is used as an adjunct to epithems; or triturated with magnesia, it is sprinkled upon superficial inflammations of the skin, or rheumatic and œdematous swellings. Dissolved in oil or alcohol, it is applied externally in rheumatic and gouty affections, indolent swellings, also in paralytic disorders, weakness of the limbs and neuralgias. In malignant small pox, camphor in powder has been strewed in the bed; and combined with cinchona, it is sprinkled on fungous or malignant ulcers. Dissolved in almond oil, it is used for touching ulcers in the mouth from excessive salivation.

Off. Prep.—Mistura camphoræ, *L. D.* Emulsio camphorata, *E.* Mist. camphoræ cum magnesia, *D.* Tinctura camphoræ, *E.* Spiritus camphoræ, *L.* Tinct. camph. comp. *L.* Tinct. opii camphorat. *E. D.* Acidum acet. camph. *E. D.* Linimentum camphoræ, *L. E.* Lin. camph. comp. *L. D.* Lin. hydrargyri, *L.* Lin. saponis, *L. E. D.* Lin. sap. cum opio, *E. D.* Oleum camphoratum, *D.*

CANELLA ALBA*. *Lond. Ed. Dub.*

Willd. *g.* 942, *sp.* 1.—*Dodecandria Monogynia.*—Nat. ord. *Oleraceæ*, Linn., *Meliaceæ*, Juss.

Canella alba.

Off.—The bark.

CANELLÆ ALBÆ CORTEX. *Ed.* CANELLÆ CORTEX. *Lond.* CORTEX. *Dub.*

THE canella alba is a tall tree, which is very common in Jamaica, and other West-India islands. The bark was introduced into Europe, according to Clusius, in 1605. It occurs in the shops either in quills about an inch thick, or in larger flatter pieces; externally yellowish white, subrugose, marked with transverse reddish lines; half a line to one line thick; brittle, fracture whitish, clear, and smoothish, with a weak aromatic smell, and a bitterish acrid taste, like a mixture of pepper and cloves. Powder white. It must not be confounded with *Winter's bark.* In distillation with water it yields a large proportion of a very active volatile oil, of a yellow or rather reddish colour, and of a sweet odour. M. Henry also obtained resin, volatile oil, extractive and colouring substance, gum, starch, albumen, acetates of potass and lime, muriates of potass and magnesia, and oxalate of lime.

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* *Syn.* Cortex Winteranus spurius, (*Officin.*) Canelle blanche, Fausse ecôrce de Winter, (*Fr.*) Weisser Zimmet, (*Ger.*) Canella bianca, (*It.*)

Med. use.—Canella alba is sometimes employed where a warm stimulant to the stomach is necessary, In America it is considered to be a powerful antiscorbutic. It is also added as a corrigent to other medicines.

Off. Prep.—Tinct. gentianæ comp. *E.* Vinum gent. comp. *E.* Vinum aloes, *L. D.* Pulvis aloes cum canella, *D.*

CANTHARIS VESICATORIA[*]. *Ed. Dub.* CANTHARIS. *Lond.*

Cantharis vesicatoria, Latreille, *Gen. Crustac. et Insectorum;* Lamarck, *Hist. Nat. des animaux sans vertebres.*

Insecta Celeoptera, Vesicantia.

Spanish fly. Blistering fly.

Off.—The insect.

CANTHARIS. *Lond.* CANTHARIS VESICATORIA. *Ed. Dub.*

THE officinal cantharides have a green and gold shining body, from 6—10 lines long, and two or three broad, having green-striped flexible long elytræ, covering brown membranous wings; black tarsi and filiform antennæ. Their smell is strong, virose, very disagreeable, and compared to that of mice. It assists in discovering their swarms when they are to be collected. Their taste is acrid, burning and urinous. Their powder is of a grey brown, dotted with brilliant points, larger than the rest of the particles, which are the fragments of the elytræ, feet and head. It is a mistake that they are more active in coarse than in fine powder. Cantharides, notwithstanding their acrimony, are exceedingly apt to get mity; and it has been suggested, that their vesicating property is not thereby impaired; but in the Pharmaceutical Society of Paris, it was the general opinion, that although the cantharides themselves do not lose their vesicating property by being reduced to powder by mites, they are less active in proportion to the quantity of mites in the powder. Many methods have been proposed for the preservation of cantharides. The addition of camphor retards, but does not impede their destruction. It has been recommended to kill them with impure pyrolignic acid instead of vinegar, to pour into the vessel in which they are deposited a glass of alcohol before binding it up, and even to add some chloride of lime; but probably no method is superior to that of putting them, as soon as they have been sifted and dried, into glazed earthen pots, or glass bottles, and to cover them up close with earthen or glass covers, luted on with wax-lute.

They are found in all the warmer countries of Europe, especially Spain. They appear in the neighbourhood of Paris about the summer solstice, in swarms, upon the poplars, privets, roses, and especially on the ashes, whose leaves they devour; and it is dangerous to remain under the trees occupied by them. They are collected in the morning before sunrise, and while still torpid from the cold and dampness of the night. A person protected by a mask and gloves shakes the trees, beneath which cloths have been spread. The insects are quickly gathered up, put upon a sieve, and killed by the fumes of boiling vinegar or ammonia; but the latter gives them a slightly azure tint. They are then dried in a stove, by which they lose about seven-eighths of their weight, so that about fifty of them weigh only a drachm. The *melolontha vitis* is sometimes found mixed in considerable numbers with the cantharides. They are easily distinguished by their almost square body; and as they do not stimulate the skin, they should be picked out before the cantharides are powdered. In the East Indies the *Meloë trianthema* is used as a substitute. In Europe the *Meloë proscarabœus*, *M. majalis*, *Coccinella 7-punctata*, and *Mylabris cichorii* possess similar acrid properties.

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[*] *Syn.* Cantharide, (*Fr.*) Spanische Fliege, (*Ger.*) Cantarella, (*It.*)

Cantharides should never be purchased in powder, and only a small quantity of them should be powdered at a time.

Neumann got from 1920 grains, 920 watery, and afterwards 28 alcoholic extract; and inversely, 400 alcoholic, and 192 watery. Lewis ascertained that extracts made with either water or with alcohol blistered, as far as could be judged, equally, and as effectually as cantharides in substance. Both the residua were inactive. Thouvenel considered the vesicating power to reside in a green matter of an oily nature: Beaupoil in two substances, one yellow and the other black, both soluble in water, but separable by alcohol. Lastly, Robiquet, in a very detailed analysis, says, that neither of these three principles, when pure, blisters; but that this property resides essentially in a particular white crystalline substance soluble in warm alcohol, separating as it cools, in small scaly crystals soluble in ether and oils, and insoluble in water, to which the name of *Cantharidine* has been given. It is dissolved in the infusion by its combination with the black and yellow substances. He also found a green fixed oil soluble in alcohol; a black substance soluble in water, insoluble in alcohol, and yellow viscid substance soluble in both menstrua, and a greasy substance soluble in neither. These were all inert. They likewise contained the phosphates of lime and magnesia, and free acetic and citric acids. M. Chereau found that the green and gold matter of the *elytræ* was insoluble in any menstruum, and is not destroyed by a scorching heat. Hence a powder deprived of its active and soluble principles would retain the characteristic appearance of cantharides.

Med. use.—Cantharides have a peculiar nauseous smell, and an extremely acrid burning taste. Taken internally, they often occasion a discharge of blood by urine, with great irritation. If the dose be considerable, they seem to inflame and ulcerate the whole intestinal canal; the stools become mucous and purulent; the breath fetid and cadaverous; intense pains are felt in the lower belly; the patient faints, grows giddy, delirious, and dies. Applied to the skin, they first inflame, and afterwards excoriate the part, raising a more perfect blister than any of the acrid vegetables, and occasioning a more plentiful discharge of serum; but even the external application of cantharides is often followed by a strangury, accompanied with thirst and feverish heat.

The inconveniences arising from the use of cantharides, whether taken internally, or applied externally, are best obviated by drinking plentifully of bland emollient liquids, such as milk, emulsions, &c. The specific property of counteracting cantharides, ascribed to camphor, is much disputed. The interposition of a piece of fine gauze between the surface of the blister and the skin has also been recommended, and more recently a piece of blotting paper soaked in oil.

The internal use of cantharides is at all times doubtful, and requires the most prudent management. They have, however, been sometimes employed with success in dropsy, and in diseases of the urinary organs arising from debility, especially gleet and leucorrhœa, and now even in gonorrhœa and incontinence of urine. They are given in substance, in very small doses, or in tincture.

Applied externally, they are one of our best and most powerful remedies. By proper management, they may be regulated so as to act as a gentle stimulus, as a rubefacient, or as a blister.

Blisters are applied, to increase excitement in general, by means of their irritation; to increase the activity of a particular organ; to diminish morbid action in particular organs, by means of the irritation which they excite in the parts to which they are applied.

They may be employed with advantage in almost all diseases accompanied with typhoid fever, especially if any important viscus, as the brains, lungs, or liver, be at the same time particularly affected. In these cases, the blisters cannot be applied to the diseased organs themselves, but as near them as may be convenient. When we wish to excite action in any organ, the blisters are, if possible, applied directly to the diseased organ.

Off. Prep.—Tinctura cantharidis, *L. E. D.* Emplast. canthar. *L. E. D.* Empl. canth. comp. *E.* Ceratum canth. *L.* Unguent. canth. *L. D.* Ung. infusi canth. vesicat. *E.*

CAPSICUM ANNUUM *. *Ed. Dub. Lond.*

Willd. *g.* 384, *sp.* 1.; Spr. *g.* 748, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ,* Linn. Juss.

Cockspur pepper. Cayenne. Chilies.

Off.—The fruit or berry.

FRUCTUS CAPSICI ANNUI. *Ed.* CAPSULÆ CUM SEMINIBUS. *Dub.* CAPSICI BACCÆ. *Lond.*

THIS is an annual plant, a native of South America, cultivated in large quantities in our West-India islands, and even frequently in our greenhouses, for the beauty of its pods.

The pods of this species are long, pointed, and pendulous, when ripe of a bright orange red. They are filled with a dry loose pulp, and contain many small, flat, kidney-shaped seeds. The taste of Capsicum is extremely pungent and acrimonious, setting the mouth, as it were, on fire.

The principle on which its pungency depends, I find, is soluble in water and in alcohol, is not volatile, reddens infusion of turnsole, and is precipitated by infusion of galls, nitrate of mercury, muriate of mercury, nitrate of silver, sulphate of copper, sulphate of zinc, red sulphate of iron, (but the precipitate is neither blue nor green,) ammonia, carbonate of potass, and alum, but not by sulphuric, nitric, or muriatic acid, or silicized potass. Braconnot also has since ascertained, that the acrid principle is not volatile, and is soluble in water, and more readily in alcohol and in ether.

Cayenne pepper is an indiscriminate mixture of the powder of the dried pods of many species of capsicum, but especially of the *capsicum frutescens,* or bird pepper, which is the hottest of all. Cayenne pepper, as it comes to us in powder from the West Indies, changes infusion of turnsole to a beautiful green, probably owing to the muriate of soda, which is always added to it, or to red oxide of lead, with which it is said to be adulterated.

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* *Syn.* Poivre de Guinée, Poivre d'Espagne, (*Fr.*) Spanischer Pfeffer, Türkischer Pfeffer, (*Ger.*) Peperone commune, (*It.*) Móllághai, (*Tam.*) Mérápakāia, (*Tel.*) Brahn maricha, (*Sans.*) Lāl mirchie, (*Hind.*) Fúlfili surkh, (*Pers.*) Felfelachmar, (*Arab.*) Meneshéna, (*Can.*) Lombok, (*Jav.*) Lada miru, (*Mal.*) Tabia, (*Bali.*) Gasmiris, (*Cyng.*) Tambhudda meerchingay, (*Mah.*)

Med. use.—These peppers have been chiefly used as a condiment, and are an essential ingredient of the curry powders. They prevent flatulence from vegetable food, and have a stimulant effect on the stomach, possessing all the virtues of the oriental spices, without, according to Dr Wright, producing those complaints in the head which the latter are apt to occasion. An abuse of them, however, is supposed to produce visceral obstructions, especially of the liver. In the practice of medicine, they constitute one of the simplest and strongest stimulants, their action not being followed by any narcotic effects. They are used in dyspepsia, accompanied with much flatulence, in atonic gout, tympanites, and palsy. Dr Wright says, that in dropsical and other complaints, where chalybeates are indicated, a minute portion of powdered capsicum forms an excellent addition; and he recommends its use in lethargic affections. It has also been successfully employed as a gargle in cynanche maligna, when it has resisted the use of cinchona, wine, and the other remedies commonly employed; and it is frequently used in relaxed sore throats. Coma and delirium are commonly attendants of tropical fevers; and in such cases, cataplasms of capsicum have a speedy and happy effect. They redden the parts, but seldom blister, unless when kept on too long. In ophthalmia from relaxation, the diluted juice of capsicum is a sovereign remedy. Dr Adair gave in *cachexia Africana* six or eight grains for a dose, made into pills; or he prepared a tincture, by digesting half an ounce of the pepper in a pound of alcohol, the dose of which was one or two drachms diluted with water.

Off. Prep.—Tinctura capsici, *D. L. E.*

CARBO LIGNI. Carbo ligni recens. *Lond.* CARBO LIGNI. *Ed. Dub.*

Charcoal of wood *.

CARBON, in a state of great purity and extreme aggregation, is the well-known precious mineral the *diamond.* It possesses a very high degree of lustre, transparency, hardness, and refractive power. It is crystallized, and generally colourless. Its specific gravity is about 3.5. It is insoluble in water, and can neither be melted nor vaporized by caloric. It is a non-conductor of electricity. It is not acted upon by any chemical agent, except oxygen, at very high temperatures, when it undergoes combustion.

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* *Syn.* Charbon, (*Fr.*) Holzkohle, (*Ger.*) Carbone di ligno, (*It.*) Adápoo, cúrrie, (*Tam.*) Lippe anghooroo, *Cyn.*) Poi-bogooloo, (*Tel.*) Khoyla, (*Duk. & Hind.*) Arang, (*Malay.*) Fuhm chobie, Zegāl chobie, (*Pers.*)

Plumbago and incombustible coal are native varieties of carbon in a state of less aggregation, and somewhat impure. In the former, it is combined with a little iron; in the latter with earthy matter. The most remarkable peculiarity of these substances is the very high temperature necessary for their combustion.

Common charcoal of wood is another, and the most common form of carbon. It is obtained by exposing wood to a high temperature without the free contact of air, or, as it is called, by destructive distillation, in close vessels. It then appears in the form of solid masses, of a black colour, and more than twice as heavy as water, as is evident from the manner in which it sinks, although it is stated in chemical books to be lighter than water. It has neither smell nor taste. It is brittle, and never crystallized; it rapidly attracts moisture, so as to acquire an increase of from 12 to 14 *per cent.* of weight. When dry, it also absorbs several times its bulk of any gas in which it is placed. It absorbs light strongly, is refractory in the fire, insoluble in water, and a bad conductor of caloric, but an excellent one of electricity. In vacuo, and in gases on which it has no action, it is slowly volatilized by the highest power of galvanism. At a red heat it burns rapidly in oxygen gas, and the product is carbonic acid gas, which is exactly equal in volume to the oxygen consumed; by weight the proportions are 27.27 and 72.73. It also burns in atmospheric air, but less vividly. Common charcoal always furnishes a little water on its combustion, but charcoal from the decomposition of oil gives carbonic acid alone.

Carbon combines with iron, forming steel. It is a constituent of almost all animal and vegetable substances; and is obtained from them by exposing them to heat in close vessels.

There are several varieties of charcoal used in medicine or pharmacy.

I. Vegetable charcoals.
  - *a.* Dense; from the charring of oak, beech, and other hard woods, used as fuel.
  - *b.* Gritty; from bread, used as a dentifrice.
  - *c.* Light; from willow and vine twigs.
  - *d.* Saline; from fuci, *æthiops vegetabilis,* in bronchocele.
  - *e.* Wood soot—*fuligo ligni,* given as an antispasmodic.
  - *f.* Oil soot—lamp black.

II. Animal charcoal.
  - *a.* Burnt bones—ivory black, for destroying foreign smells and colours.

b. Cuttle-fish bone, à dentifrice.
c. Burnt sponge; in bronchocele.
III. Mineral charcoal.
a. Coke, used as fuel.

Charcoal, especially animal charcoal, was found by Lowitz to possess the remarkable property of absorbing and then removing certain adventitious colours and smells from animal and vegetable matters, and hence it has become a valuable means of purifying vegetable principles, and for checking and correcting putrescency.

Charcoal, as it is commonly prepared, is not a pure carbon, but contains also a notable proportion of hydrogen, from which it may be purified by exposing it for some time to a strong heat. Münch directs, that for medical use it be reduced to fine powder, and heated in a covered crucible, as long as any flame appears on removing the cover, and until it be fully red. It is then to be allowed to cool in the furnace, the upper layer of the powder to be removed, and the remainder to be sealed accurately up in ounce vials.

The Paris Pharmacopœia has given a formula for preparing charcoal. They direct that to charcoal of lime-tree, willow, poplar, or any other light wood, thoroughly burnt, very light, ringing and pure, water be added, but not more than to moisten it; and that it be then pounded in an iron mortar, or ground in a mill, so as to make a soft fluid mass, which is to be left at rest for some days, and then put upon a linen cloth that the water may be removed. Of this paste round cakes are to be made, which are to be exposed to the rays of the sun to be thoroughly dried. It is added in a note, that by the insolation a singular efficacy is imparted to the charcoal, which that dried in the shade does not possess in an equal degree, as thus any adventitious colour and all smell are entirely removed.

For pharmaceutic purposes, such as depriving morphia, sulphate of quinia, and the other vegetable principles, of foreign colouring matter, animal charcoal, or ivory black, from which the earthy part has been removed by treating it with dilute muriatic acid, and afterwards by alkaline ley, is by far the most efficacious.

Med. use.—From its acknowledged effects in correcting the putrescency of animal matters, charcoal has been employed to destroy the fœtor of privies, and especially of those in camps and hospitals, where dysentery prevails. With the same view, it is applied in the form of a cataplasm, to gangrenous and fœtid ulcers, porrigo, and in all cases of putrescent secretions. Charcoal, especially that of vine twigs, or of the cuttle-fish bone, is the basis of most of the empirical dentifrices; and its virtue in correcting fœtid breath from carious teeth is well established. Even in the stomach, it is probable that it exerts the same chemical action, and that it is capable of correcting the putrid eructations in some cases of dyspepsia, against which it has been recommended in ten grain doses. Taken in larger quantity, as a table-spoonful, two or three times a-day, with syrup of roses, it is said to remove habitual costiveness. Dr Jackson gave it in half-drachm doses with excellent effect in dysentery. Charcoal was recommended as a specific in ague by Dr Calcagno of Palermo, and it was much used by our medical officers in Sicily. They gave a scruple every two hours, drinking after each dose four ounces of water acidulated with sulphuric acid.

When the pneumatic pathology was in fashion, and phthisis and similar diseases were ascribed to hyper-oxygenation of the system, charcoal was strongly recommended as a powerful disoxygenising remedy, and cases of its successful employment are even recorded.

Off. Prep.—Cataplasma carbonis ligni, *D.* Barytæ murias, *D. E.*

CARDAMINE PRATENSIS [*]. *Ed. Dub. Lond.*

Willd. *g.* 1257, *sp.* 19; Spr. *g.* 2312, *sp.* 25; Smith, *Flor. Brit. g.* 304, *sp.* 4. *Tetradynamia Siliquosa.*—Nat. ord. *Siliquosæ*, Linn., *Cruciferæ*, sect. *Sisymbriæ*, Juss.

Meadow ladies smock. Cuckow flower.

Off.—The flowers.

CARDAMINES FLORES. *Lond.* FLORES. *Dub.* CARDAMINES PRATENSIS FLORES. *Ed.*

LADIES SMOCK is an indigenous perennial plant, which grows in meadow grounds, and produces purplish flowers in the spring. In its sensible qualities it resembles the cresses, having, when fresh, a pungent smell and taste, which disappear on drying.

Med. use.—Long ago the flowers were employed as a diuretic; and they have been again introduced in nervous diseases, as epilepsy, hysteria, chorea, asthma, &c. A drachm or two of the powder is given twice or thrice a-day. It has little sensible operation, and I am inclined to think that when dried and powdered it is rendered perfectly inert.

CARYOPHYLLI. *Lond. Dub.* See EUGENIA.

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[*] *Syn.* Cresson des pres, (*Fr.*) Die Wiesenkresse, (*Ger.*) Kardamindo, (*It.*)

CARUM CARUI[*]. *Ed. Dub. Lond.*

Willd. *g.* 561, *sp.* 1; Spr. *g.* 887, *sp.* 1; Smith, *Flor. Brit. g.* 152, *sp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ,* Linn. Juss.

Common caraway.

Officinal.—The seeds.

CARUI SEMINA. *Lond.* SEMINA. *Dub.* CARI CARUI SEMINA. *Ed.*

CARAWAY is a biennial umbelliferous plant, cultivated in our gardens, both for culinary and medicinal use. The seeds have an aromatic smell, and warm pungent taste, and yield much essential oil.

Med. use.—They are employed as stomachic and carminative in flatulent colics.

Off. Prep.—Oleum seminum carui, *D. L.* Aq. carui, *D. L.* Spiritus carui, *L. E. D.* Spt. juniperi comp. *D. L.* Tinct. cardam. comp. *D. L.* Tinct. sennæ comp. *D. L.* Confectio opii, *D. L.* Conserva rutæ, *L. D.* Decoct. anthem. nobilis, *E.* Empl. cumini, *L.*

CASCARILLA. *Dub. Lond.* See CROTON.

CASSIA. *Dub.* See LAURUS.

CASSIA[†].

Willd. *g.* 813; Spr. *g.* 1627; *Decandria Monogynia.*—Nat. ord. *Lomentaceæ,* Linn., *Leguminosæ,* sect. *Papilionaceæ,* Juss.

Spr. *sp.* 4. CASSIA FISTULA. *Ed. Dub. Lond.*

Cassia tree[‡].

Off. —The fruit and its pulp.

CASSIÆ PULPA. Lomentorum pulpa. *Lond.* PULPA LEGUMINIS. *Dub.* CASSIÆ FISTULÆ FRUCTUS. *Ed.*

THIS tree is indigenous in India and Egypt, and is cultivated in Jamaica. It rises to about thirty feet in height, and has long flower spikes, with yellow papilionaceous blossoms.

Its fruit is an indehiscent cylindrical pod, scarcely an inch in diameter, a foot or more in length; the outside is a hard brown bark, the valves of botanists; the inside is divided by thin transverse woody plates, *dissepimenta*, covered with a soft black pulp, of a sweetish taste, with some degree of acrimony. There are two sorts of this drug in the shops; one brought from the East Indies, the other from the West. The canes or pods of the latter are generally large, rough, thick-rinded, and the pulp nauseous; those of the former are smaller, smoother, the pulp blacker and of a sweeter taste, and are preferred to the other. Such pods should be chosen as are heavy and new, and do not, when shaken, make a rattling noise, from the seeds being loose within them. The pulp should be of a bright, shining, black colour, and have a sweet taste, neither harsh, which happens from the fruit being gathered before it be fully ripe, nor sourish, which it is apt to become upon keeping, nor at all mouldy, which is frequently the case from its being kept in damp cellars, or moistened, in order to increase its weight. Greatest part of the pulp dissolves both in water and in alcohol, and may be extracted from the pod by either. The shops boil the bruised pod in water, and afterwards evaporate the solution to a due consistence.

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[*] *Syn.* Cumin sauvage, Carvi, (*Fr.*) Gemeiner Kummel, Feldkummel (*Ger.*) Comino, (*It.*)

[†] My friend, Dr Colladon, physician at Paris, published at Montpellier, in 1816, a most valuable monography of the very extensive genus *Cassia,* in composing which he enjoyed the assistance of De Candolle.

[‡] *Syn.* Casse fistulense, Carneficier, (*Fr.*) Röhrleincassie, Purgircassie, (*Ger.*) Cassia fistula, (*It.*) Konnekāi, Sārákonnekāi, (*Tam.*) Amultas, (*Duk. Hind.*) Khyar shember, (*Arab.*) Khyar chember, (*Pers.*) Dranguli, Toong-gooli, (*Jav.*) Rayla-kāiā, (*Tel.*) Mentus, (*Malay.*) Suvărnăká, (*Sans.*) Cakay, (*Can.*) Ahilla, (*Cyng.*) Sonali, (*Beng.*)

Vauquelin has analyzed this pulp, and found it to consist of parenchyme, gluten, gelatine, gum, extractive and uncrystallizable sugar. With this the more recent analysis of M. Henry nearly agrees: He got sugar, 12.20; gum, 1.35; a kind of tannin, 2.65; gluten, trace; colouring principle, a little; water and loss, 3.80 = 20.

Med. use.—The pulp of cassia, from its saccharine and extractive constituents, is a gentle laxative medicine, and is recommended, in a dose of some drachms, in costive habits. Some direct a dose of two ounces, or more, as a cathartic, in inflammatory cases, where the more acrid purgatives are improper; but in these large quantities it generally excites nausea, produces flatulence, and sometimes gripings of the bowels, especially if the cassia be not of a very good kind: these effects may be prevented by the addition of aromatics, and by exhibiting it in a fluid form.

Off. Prep.—Electuarium cassiæ, *D. L.* Confectio cassiæ, *L.* Confectio sennæ, *L.* Elect. sennæ comp. *E.* Pulpa cassiæ, *L. E.*

Willd. *sp.* 24. CASSIA SENNA [*]. *Ed. Lond. Dub.* C. LANCEOLATA, Spr. *sp.* 68.

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[*] *Syn.* Séné de la palthe, Casse d'Italie, Séné Moka, (*Fr.*) Morgenländische Senna, Italienische Senna, (*Ger.*) Sena, (*It.*) Nilāvérei, Nilāvāghei, (*Tam.*) Soona mukki, (*Hind. Duk.*) Sana pat, (*Beng.*) Sunā, (*Arab.*) Nayla tungādoo, Nela ponna, (*Tel.*) Nilāverie, (*Cyng.*) Amshúnāttydivándivá, Bootallapotoka, (*Sans.*)

Senna.

Off.—The leaves, or rather folioles.

Cassiæ sennæ folia. *Ed.* Sennæ folia. *Lond.* Folia. *Dub.*

M. Rouillure, apothecary, who was one of the expedition to Egypt, has made us well acquainted with the natural history of senna.

From Egypt, under the title of Senna, the leafits, mixed with the pods of two species of cassia, are exported, both natives of Egypt and the neighbouring countries. Both are small shrubs, almost herbaceous, with pinnated leaves, but easily distinguished by the form of the folioles, from which they derive their trivial name.

First species, and the most esteemed, *Sené du Levant, de Seyde, de la palte,* which belongs to the *Cassia lanceolata.* Leaves alternate. Leafits oblong, sharp-pointed at the ends, about a quarter of an inch broad, and not a full inch in length, unequally divided by the middle rib, without prominent lateral fibres, of a lively yellowish-green colour, a faint, not very disagreeable smell, and a subacrid, bitterish, nauseous taste. This senna is found some leagues above Syène, in a valley called Bicharie, in Abyssinia and Sennaar.

Second species belongs to the *Cassia senna,* (*C. obovata.*) Leaves broader than the preceding, rounded, of a pale green colour; taste sweetish, and without smell. Is found in Upper Egypt; less purgative than the former.

These two species are mixed in commerce, and also with a third leaf, which is not a senna, but a species of *Apocynum,* designated by MM. Rouillure and Delisle, under the name of *Cynanchum argel,* or *Cynanchum oleifolium.* The leaves of the *Cynanchum* are regular at the base, whereas the folioles of the sennas are always oblique.

The general mart for Egyptian senna is Boullac, near Grand Cairo, where they mix the senna in the following proportions:—Lanceolated senna, 500; obovate senna, 300; and argel, 200 parts.

When they reach Europe they are still further adulterated by the admixture of the folioles of the *Colutea arborescens,* which are very like the obovate senna, but are perfectly symmetrical, not oblique.

A more dangerous admixture takes place at Marseilles, with the leaves of the *Coriaria myrtifolia,* which is an actual poison, and has produced fatal effects. They are much larger than the leafits of the senna, and are therefore always in fragments.

By far the greater part of the senna of commerce in Britain is called East Indian senna, although it is not the growth of the East Indies. Dr Adams of Calcutta informs me, that the senna used in India is known in the bazars by the title of Senna Mukkhi or Mekki, which is enumerated by Colladon among the synonimes of the *C. lanceolata* of Forskahl, *C. acutifolia* of Delisle. It is imported from the Persian Gulf, and is probably the growth of the Arabian shore near Mekka. From Calcutta it is re-exported to London. A specimen sent to me by Dr Adams differs in no respect from the East Indian senna of the shops. The small quantity of senna which is the produce of the East Indies is blunt pointed, and very inferior in quality. For some years past there has been imported into France a senna, called East Indian; but according to Lemaire Lisancourt, it is the product of a species of senna which grows on the west coast of Africa, from the Isle of Goree to Sierra Leone, and over all Senegambia, and to which he has given the name of *Cassia elongata.* Of this origin I am exceedingly doubtful, as I do not find senna noticed by any of the travellers into West Africa; and I think the conjecture of M. Fee very probable, that it is the Mocha senna, after having been carried to the East Indies, deposited in the English settlements on the west coast of Africa, and transmitted to the European states as an indigenous variety. In America they now use the folioles of the *Cassia Marylandica.* What is called *Grabeaux de sené,* contains little real senna.

Senna leaves have been analyzed by MM. Lassaigne and Feneulle. Ether extracted a green tincture, but elevated nothing on distillation, and left a residuum of chlorophylle and a greasy oil. Water distilled from senna became milky, and acquired its peculiar smell. The decoction was of a reddish yellow, and had a bitter taste, with uncombined acid. It was precipitated by acetate of lead, which carried down malic acid and some colouring matter. The liquor was treated with sulphuretted hydrogen to separate all lead, and evaporated to dryness, and redissolved in alcohol, which left a little mucus and colouring matter. It was again evaporated to the consistence of an extract, and treated with alcohol, acidulated with sulphuric acid, to separate some acetate of potass, and the sulphate of potass formed was separated by filtration. The sulphuric acid added in excess was precipitated by acetate of lead, the lead removed by sulphuretted hydrogen, and the liquor finally evaporated to dryness. To the substance obtained by this process, these chemists have given the name of *Cathartine,* considering it to be the purgative principle of the senna, as in small doses it purges with slight colic pains. Cathartine is not crystallizable, is deliquescent, has a reddish yellow colour, a peculiar smell, a bitter nauseous taste, is soluble in all proportions in alcohol and water, insoluble in ether. Its watery solution is precipitated in yellowish flocculi by infusion of galls and subacetate of lead. It is not precipitated by sugar of lead, iodine, tartar emetic, or gelatine. Its colour is destroyed by chlorine, and deepened by the alkalies; and it is rendered brown by persulphate of iron. It did not yield ammonia by destructive distillation. The rest of the analysis is less important in relation to medicine; but the result of the whole was, that senna leaves consisted of chlorophylle, greasy oil, volatile oil in small quantity, albumen, cathartine, yellow colouring principle, mucus, malic acid, malate and tartrate of lime, acetate of potass, and mineral salts.

Med. use.—Senna is a very useful cathartic, operating mildly, and yet effectually; and, if judiciously dosed and managed, rarely occasioning the bad consequences which too frequently follow the exhibition of the stronger purges. The only inconveniences complained of in this drug are, its being apt to gripe, and its nauseous flavour. These are best obviated by adding to the senna some aromatic substance, as cardamom, ginger, cinnamon, &c. and by facilitating its operation by drinking plentifully of any mild diluent.

Senna may be given in substance to the extent of about a drachm, but this is rather too bulky, and it is therefore better to divide it into two doses, and to take one-half at night, and the other in the morning. It is more conveniently given in the form of infusion, which is generally made by pouring about six ounces of boiling water upon from two to six drachms of senna leaves in a tea-pot, and letting it stand about an hour. Senna ought never to be ordered in decoction, Gren says, because it becomes perfectly inert, from the total dissipation of the nauseous and volatile principles on which its purgative effects depend. It has been customary to reject the pedicles of the leaves of senna, as causing gripes and pains in the bowels; but this is a mere prejudice, for both leaves and pedicles act in the very same way.

The tincture, on account of the menstruum, cannot be given in doses large enough to purge.

Off. Prep.—Tinct. sennæ comp. *D.* Elect. sennæ, *D. E.* Confect. sennæ, *L.* Infus. sennæ, *L. E.* Infus. sennæ comp. *D.* Infusio sennæ cum tamarindis, *D.* Extract. cassiæ sennæ, *E.* Pulvis sennæ comp. *L.*

CASTOR FIBER. *Ed. Dub.* CASTOR FIBER ROSSICUS. *Lond.* *Mammalia Rodentia*, Cuvier.

The beaver *.

Off.—Castor, a concrete substance of a peculiar nature.

CASTOREUM. *Ed. Dub.* CASTOREUM, concretum sui generis. *Lond.*

THE beaver is an amphibious quadruped, strongly characterised by its flat, horizontal, scaly tale. It is found in the northern parts of Europe, Asia, and America, on the banks of lakes and rivers. In inhabited countries it is a solitary slothful animal, but in desert regions it lives in society. Their remarkable manners in this state, and the immense works effected by the united labours of the individuals of their republic, have rendered the natural history of this animal familiar to every one. In both sexes, between the anus and pudendum, there are four follicles, of an oblong shape, smaller above and larger below, formed of a tough membrane. The two largest and undermost of these, which are also connected, and lie parallel and close to each other, contain an oily fluid secretion, which is the substance known by the name of Castor. It is preserved by cutting out the entire bags, and drying them in the smoke.

The best castor comes from Russia, Prussia, and Poland. The cods should be dry, gibbous, roundish, heavy, solid, and filled with a solid substance contained in membranous cells, somewhat tough, but brittle, of a dark brown colour, of a peculiar disagreeable, narcotic smell, and a nauseous, bitter, acrid taste. The Canadian castor is of an inferior quality; the cods are smaller, thin, oblong, and much corrugated, and the castor itself has much less smell and taste.

M. Fee has placed their most obvious characteristics in contrast.

CANADIAN.	RUSSIAN.
Dry and almost friable; smell feeble; taste acrid and bitter; membranous bags containing it blackish; not larger than an egg; traversed by very tough cellular membranes; colour red brown.	Hard, brittle, but not friable; very heavy, rusty or liver coloured, larger than Canadian castor; mixed with membranes weakly tenacious; smell penetrating, sharp and disagreeable; taste acrid, bitter and nauseous.
The tincture precipitated by ammonia, gives an orange precipitate.	Tincture precipitated by ammonia gives a whitish precipitate.
This variety is often adulterated.	

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* *Syn.* Le Castoreum, (*Fr.*) Das Bibergeil, (*Ger.*) Castoreo, (*It.*) Boboowaja struja, (*Russ.*) Ashbutchegān, (*Arab.*) Goonbeyduster, (*Pers.*)

What is very old, quite black, and almost destitute of smell and taste, is unfit for use, as well as the counterfeited castor, which is a mixture of various gummy resins and other substances, with a little real castor, artificially interspersed with membranes, and stuffed into the scrotum of a goat. This imposition is easily detected, by the weaker degree of its smell and taste, by chemical analysis, and even by mere external examination; for to the real bags, the two smaller and upper follicles, filled with the fatty matter, are always attached.

Bouillon Lagrange found it to be composed of a resin, adipocere, volatile oil, and extractive; and Laugier discovered benzoic acid in it. Bonn of Amsterdam analyzed fresh castor, and found it to consist of one-third of volatile oil, one-half of adipocere, and a little resin; one-sixth of membrane, and one-fourth of carbonate of lime. It lost by drying 40 *per cent.* The essential oil therefore seems either to be dissipated by drying, or converted into resin by the absorption of oxygen. The most recent analysis is by M. Brandes. He found in it a peculiar principle, *Castorine;* volatile oil; the urate, carbonate, and benzoate of lime; a resinoid substance; albumen; a kind of osmazome; acetate and muriate of soda; muriate, benzoate, and sulphate of potash; phosphate and sulphate of lime; mucus; carbonate of ammonia and membrane.

Castorine crystallizes in long, diaphanous and fasciculated prisms; has the smell of castor, of which it seems to be the active principle; taste coppery. It is insoluble in cold water and in cold alcohol; soluble in 100 parts of boiling alcohol, and in the volatile oils. It has none of the properties of an acid or an alkali.

Med. use.—Castor acts chiefly on the nervous system, and is very little heating. It is given with advantage in the nervous stage of typhoid fevers, in nervous diseases in general, and hence is considered antispasmodic and anodyne. In *agrypnia* and palpitation from anxiety, I often find it have excellent effects. It is also given with advantage in spasmodic diseases, especially in hysteria and epilepsy, and in cases of difficult parturition, from a spasmodic contraction of the mouth of the uterus after the membranes have burst in amenorrhœa.

It is exhibited most advantageously in the form of powder, in doses of from 10 to 20 grains, and in clysters, to a drachm, Diluted alcohol extracts its virtues; therefore it may be also given in the form of tincture. But its exhibition in the form of extract or decoction is improper.

Off. Prep.—Tinctura castorei Rossici, *D.*

CATECHU. *Lond. Dub.* See ACACIA.

CENTAUREA BENEDICTA*. *Ed.* CNICUS BENEDICTUS. *Dub.*

Centaurea, Willd. *g.* 1548, *sp.* 89.; Spr. *g.* 2661, *sp.* 144; *Syngenesia Polygamia frustanea.*—Nat. ord. *Compositæ capitatæ*, Linn., *Synantheræ*, sect. *Carduaceæ*, Juss.

Blessed Thistle.

Off.—The leaves or plant.

CENTAUREÆ BENEDICTÆ HERBA. *Ed.* FOLIA. *Dub.*

THIS is an annual plant, indigenous in the Grecian islands, and cultivated in our gardens. The leaves have a very durable bitter taste, accompanied with an ungrateful flavour, from which they are in a great measure freed by drying. Water quickly extracts, even without heat, the more grateful bitter. A strong decoction is very nauseous and offensive to the stomach. Rectified spirits acquire a very pleasant bitter taste, which remains uninjured in the extract.

Med. use.—This plant is now little employed. The nauseous decoction is sometimes used to provoke vomiting, and a strong infusion to promote the operation of other emetics. But good effects have been frequently experienced from a slight infusion of carduus, in loss of appetite, where the stomach was injured by irregularities. A stronger infusion, made in cold or warm water, if drunk freely, and the patient kept warm, occasions a plentiful sweat, and promotes the secretions in general.

An extract prepared by evaporating the expressed juice, with the addition of a little alcohol, to prevent it from becoming mouldy, has been strongly recommended in the catarrh of children.

The seeds are emulsive.

CENTAUREUM. *Lond.* See CHIRONIA.

CEPHAËLIS IPECACUANHA. *Dub.* See IPECACUANHA.

CERA FLAVA. *Ed. Lond. Dub.*

Yellow wax.

FOR this useful substance we are indebted to the common honey bee *(apis mellifica,)* an insect belonging to the class of *Hymenoptera mellita* of Cuvier. Bees construct of wax the combs in which the honey and larvæ are deposited. According to Hornbostel, John Hunter and Huber, it is formed

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[*] *Syn.* Chardon benit, (*Fr.*) Kardobenedicten, (*Ger.*) Cardo santo, (*It.*)

by the bees, and is a kind of concretion which takes place upon the scaly rings which cover the posterior parts of this insect. Bees fed with sugar alone produce a great deal of wax. Wax is also a vegetable production, and is found on the surface of leaves, and the antheræ of flowers. The bloom upon the skin of plumbs, grapes, oranges, &c. is wax. It is also furnished in such abundance upon some trees as to be used for economical purposes, as *Myrica cordifolia* and *cerifera, Ceroxylon andicola* and *Benincasa cerifera.*

Yellow wax is found in the shops in round cakes, which are formed by melting the combs in hot water, after all the honey has been expressed from them. The wax swims above, and the impurities either sink to the bottom, or are dissolved in the water. When recent, it is tenacious, but brittle, of a yellow colour, and sweet honey-like smell; dry, not greasy, to the feel; insoluble in water, and in cold alcohol, or ether; soluble in boiling alcohol and ether, in the fat oils and alkalies; fusible and inflammable. In selecting it, we should observe that the cakes be brittle, have a pleasant yellow colour, and agreeable smell, no taste, do not adhere to the teeth when chewed, and burn entirely away. It may be adulterated with resin: the fraud is detected by its taste, and the action of cold alcohol, which dissolves the resin; with tallow, which is known by its being less brittle and softer, and its having an unpleasant smell; with earthy substances, which may be detected by liquefaction and straining; with pease-meal, or starch, from which it may be purified, according to Boullay, by adding two *per cent.* of strong sulphuric acid, mixing well, and then washing carefully. The sulphuric acid acts in this case as in the purification of oil, by carbonizing the amylaceous matter without acting upon the wax.

Off. Prep.—Ceratum simpl. *L.* Ungt. ceræ flavæ, *D.* Cerat. resinæ, *L.* Ungt. resinos. *E.* Ungt. resinæ albæ, *D.* Empl. ceræ, *L.* Emplast. picis nigri, *L.* Ungt. picis liquidæ, *E.* Empl. picis comp. *L.* Empl. aromat. *D.* Empl. cumini, *L.* Empl. galbani, *D.* Empl. gummos. *E.* Empl. assæfœtid. *E.* Ceratum sabinæ, *L. E.* Ungt. sabinæ, *D.* Cerat. canthar. *L.* Ungt. inf. canth. vesicat. *L.* Emplast. canth. *D. E.* Empl. canth. comp. *E.* Cerat. saponis, *L.* Cerat. calaminæ, *L.* Cerat. plumbi comp. *L.* Emplast. oxidi ferri rubri, *E.*

CERA ALBA. *Lond. Ed. Dub.*

White wax.

The yellow colour of bees wax, and its peculiar smell, may be destroyed by the combined action of water, air, and the sun's rays. In the process of bleaching wax, we therefore extend its surface as much as possible, by melting it, and forming it into thin plates, which are fully exposed to the sun's rays, upon linen stretched in frames, and repeatedly moistened until they acquire the whiteness desired. It is then usually melted into thin discs. White wax is more brittle, less fusible, and heavier than yellow wax. It is sometimes mixed with white oxide of lead, or with tallow. For medical use, it has no advantage over yellow wax. It is worthy of notice, that the white wax bleached in Britain has much less tenacity than the foreign; and hence dentists import from Hamburgh the wax they use for taking impressions of the gums, for making artificial teeth. Saussure found that purified wax melted at 145° F. Its density when solid was 0.966, when melted at 178°, 0.834, and at 201°, 0.8247. By destructive distillation it seemed to consist of carbon, 81.607; hydrogen, 13.859; and of oxygen, 4.534 = 100. Gay-Lussac and Thenard got carbon, 81.79; hydrogen, 12.67; and oxygen, 5.54. Wax may therefore be represented by oxygen and olefiant gas.

Professor John, in 1812, shewed that wax consisted of two principles, one soluble in alcohol, which he called *Cerine*, and one insoluble, *Myricine*. His experiments were confirmed and extended by Bucholz and Brandes, who have given the following contrasted view of their properties:

	Cerine.	*Myricine.*
When extracted by alcohol,	Almost Colourless	Dirty White.
After being melted,	Yellowish White	Brownish Yellow.
Smell,	Weak Waxy	Ditto.
Consistence,	Waxy	Softer.
Sp. gr.	0.969	1.000.
Solubility in boiling absolute alcohol,	$\frac{1}{18}$	$\frac{1}{122.6}$
Deposited on cooling,	Gelatinous	Distinct flocculi.
Solubility in absolute ether,	$\frac{1}{41.6}$	$\frac{1}{83}$
Time of melting,	as 4 to	3.

Med. use.—When taken internally, wax seems to agree in its effects with the fat oils, and though less frequently prescribed in this way, it is preferable, being less apt to become rancid. Poerner recommends it as an excellent remedy in diseases of the intestines, attended with pain, excoriation, and obstinate diarrhœa. He gave a scruple, or half a drachm of wax, three or four times a-day, in the form of an emulsion, by melting it first with some fixed oil, and then mixing it with a decoction of groats, by trituration with the yolk of an egg. But its principal use is in the formation of cerates, ointments, plasters, &c.

Off. Prep.—Linim. simpl. *E.* Ungt. simpl. *E.* Cerat. simpl. *E.* Ungt. ceræ albæ, *D.* Ungt. cetacei, *D.* Cerat. cetacei, *L.* Ungt. elemi, *D.* Ungt. hydrarg. oxydi nitrici, *D. L.* Cerat. plumbi acet. *L.*

CEREVISIÆ FERMENTUM [*]. *Lond. Ed. Dub.*

Barm or yeast.

BARM or yeast is a product of the fermentation by which beer is made, upon the surface of which it swims, from involving bubbles of carbonic acid gas. It may be obtained in the form of a firm brittle paste, of a greyish white colour. When confined from the contact of the air, at 65° to 75°, it undergoes the putrid fermentation; but in contact with air, it absorbs the oxygen, and forms carbonic acid. By a gentle heat it is dried, loses two-thirds of its weight, and becomes hard and brittle, and may be preserved indefinitely. In a greater degree of heat it is completely decomposed, and furnishes the same products as animal matters, by destructive distillation; gas, chiefly inflammable, 4.1; water, 20.1; carbonate of ammonia, 13.2; empyreumatic oil, 16.4; and charcoal, 35.4.

Ferment is insoluble in alcohol and in water. But boiling water deprives it of its property of exciting fermentation, without appearing to dissolve any part of it, or to alter its other properties; but it is probable that it undergoes a change like coagulation. If yeast be mixed with any saccharine liquid, under proper circumstances it excites in it the alcoholic fermentation. Mixed with a paste of flour, it excites the panary fermentation. Ferment does not seem to be a homogeneous or uniform principle, as several other azotized substances have the property of exciting these fermentations.

Med. use.—Under the idea of its opposing the putrefactive fermentation, yeast has lately been much extolled as an antiseptic remedy in putrid fevers. It has also been said to be successful in hectic fever. A table spoonful is recommended to be given as a dose, in porter, or wine and water. It is likewise given in the form of a clyster. It is applied externally, in the form of a poultice, to foul and putrid sores.

Off. Prep.—Cataplasma fermenti cerevisiæ, *D. L.*

CERUSSA. *Dub.* See PLUMBI CARBONAS.

CERVUS ELAPHUS. *Ed. Lond.*

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[*] *Syn.* Levure de bière, (*Fr.*) Bièrhefe, (*Ger.*)

Mammalia ruminantia.
The stag, or hart*.
Off.—The horns.

CORNU CERVI ELAPHI. *Ed.* CORNUA CERVINA RAMENTA. *Dub.* CORNUA. *Lond.*

THE male has two round solid horns on his forehead, with several conical branches, the number of which ascertains the age of the animal to which they belong. These horns fall off, and are renewed every year. When first produced, they are soft, full of blood-vessels, and covered with velvety skin; but they soon lose their covering, and become hard, compact, and bony.

In their nature, they do not seem to differ from bone, except in containing a large proportion of cartilage. They afford a very considerable quantity of gelatine, by decoction with water, and hartshorn shavings are still employed in domestic economy, for furnishing a nutritious and demulcent jelly. By the action of fire, their products are the same with those of animal substances in general; and they were formerly so much used for the preparation of ammonia, that it was commonly called Salt or Spirit of Hartshorn. By burning, they are totally converted into phosphate of lime.

Off. Prep.—Pulvis cornu cervi usti, *D.* Cornu ustum, *L.* Pulvis antimonialis, *D. L. E.*

CETRARIA ISLANDICA. *Dub.* See LICHEN.

CHAMÆMELUM. *Dub.* See ANTHEMIS.

CHIRONIA CENTAURIUM. *Ed. Dub. Lond.*

Willd. *g.* 394, *sp.* 9; Smith, *Flor. Brit. g.* 102, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Rotaceæ*, Linn., *Gentianeæ*, Juss.
Smaller centaury†.
Off.—The flowering heads.

SUMMITATES CHIRONIÆ CENTAURII. *Ed.* CACUMINA CENTAURII. *Lond.* FOLIA ERYTHRÆÆ CENTAURII. *Dub.*

THE genuine name of this plant, which was once *Gentiana*, and then became *Chironia*, is now *Erythræa*. It is annual, and indigenous in Scotland on dry pastures. It grows erect, and to the height of 10–15 inches. It flowers in July and August. I do not know why the Dublin College has named the leaves as being officinal. The flowering tops are the only part I have seen in shops. The Berlin College describe the officinal article to be the herb in flower, and as having an angular stem, branchy at the top; radical leaves opposite, oval, obtuse, three nerved, very entire, cauline leaves sessile; flowers reddish, of a bitter acrid taste. It should be gathered in July.

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* *Syn.* Le cerf, (*Fr.*) Der Hirsch, (*Ger.*) Cervo, (*It.*)

† *Syn.* La petite centaurée, (*Fr.*) Das Tansenguldenkraut, (*Ger.*) Centaurea minore, (*It.*)

It has not been recently analyzed, but I have little doubt that it contains *Gentianine.* Neumann got from 480 parts 210 alcoholic, and 140 watery extract, and inversely 320 watery, and 40 alcoholic.

Med. use.—It is a pure bitter, and agrees in every respect with other species belonging to the family of Gentians.

CINCHONA.

Willd. *g.* 346; Spr. *g.* 1769. *Pentandria Monogynia.*—Nat. ord. *Contortæ*, Linn., *Rubiaceæ*, Juss.

Sp. 3. CINCHONA CORDIFOLIA. *Lond. Ed.* C. FLAVA. *Dub.*
Sp. 2. CINCHONA LANCIFOLIA. *Lond. Ed.* C. OFFIC. *Dub.*
Sp. 4. CINCHONA OBLONGIFOLIA. *Lond. Ed.* C. RUB. *Dub.*

Off.—The bark, commonly called *Peruvian bark,* of which there are three officinal varieties, the *pale*, the *yellow*, and the *red.*

CORTEX. *Lond. Ed. Dub.*

THE history of the discovery of the febrifuge powers of Cinchona is uncertain. In Loxa there is no document to illustrate it, and there is no probability that the Jesuits learned its use from the natives. They obstinately retain their customs like the natives of Hindostan; and although fever is very common among them, they would rather die than take cinchona, which they class, with opiates, among the poisons causing gangrene. There is an old tradition in Loxa, that the Jesuits used to distinguish the different kinds of trees by chewing their bark, and were attracted by the great bitterness of the cinchona; and as among their missionaries there were always some acquainted with medicine, the story that they tried an infusion of it in the endemic fever of the country is not improbable. The appellation *Pulvis Comitissæ* seems to be even older than *Pulvis Jesuiticus* or *Pulvis Patrum.* There was a Count Cinchona Viceroy in Lima from 1629 to 1639, whose Countess, said to have been cured of fever by it, probably first made it known in Europe on her return to Spain in 1640.

From 1638 to 1776 no other cinchona occurred in commerce except that of Loxa and the neighbouring district. La Condamine mentions the cinchona of Riobamba and Cuença in the province of Quito, as well as that of Ayavaca and

Jaen de Bracamorros. In 1753 Don Miguel de Santisteban, in travelling from Loxa to Santa Fé de Bagota by Popayan, observed that every where at the same elevation with Loxa there were cinchona trees. From him, in 1761, Mutis received the first specimen of *C. cordifolia.* Mutis, in 1772, found cinchona near Santa Fé, and sent it to Europe from Carthagena. Till then all the cinchona was gathered in the woods of Loxa, Ayavaca and Jaen de Bracamorros, and shipped under the name of *Cascarilla fina de Uritasinga,* at Payta, to double Cape Horn. In 1776 Don F. Renquifo discovered the *C. nitida* of Ruiz at Huanuco. Ruiz and Pavon, authors of the *Flora Peruviana,* examined the valleys of the tributaries of the Amazon river, and almost at the same time cinchona was found in the northern and southern extremities of South America, in the mountains of Santa Martha, and in the kingdom of Buenos Ayres, at La Paz and Cochabamba. Since 1780 Europe has received cinchona of different value from Payta, Guayaquil, Lima, Buenos Ayres, Carthagena and Santa Martha.

Cinchona, considered as a genus, is a mountainous tree, never found in the plains, and growing between the height of 1282 and 975 toises above the level of the sea. It grows to a great height, and formerly its trunk was often thicker than a man's body; but since its bark has come into such general use, few trees are to be seen thicker than the arm. Indeed, there is reason to fear that it will become still more scarce, as no attention is paid to its cultivation, and the trees always die after being stripped of their bark. This operation is performed in the dry season, from September to November. The bark is then carefully dried in the sun, and packed in skins, which contain from 100 to 150 pounds, and are called by the Spaniards *zeronne.* In these, coarse and fine pieces of the same kind of bark are promiscuously mixed, but they are afterwards sorted. Humboldt says, that from 12 to 14,000 quintals are annually exported. 2000 are exported from Carthagena, and come from the kingdom of Santa Fé. Loxa furnished, previous to 1779, 4000 quintals, but now only 110, which are sent to Spain on account of the king. The rest is furnished by the provinces of Huamanga, Cuenço, Jaen de Bracamorros, &c. and are exported from Lima and other parts of the Pacific Ocean.

The genus cinchona is naturally subdivided into those species whose corolla is hairy and those whose corolla is perfectly smooth, and the barks of all the species included in the first division are febrifuge. They are the Condaminea, Lancifolia, Cordifolia, Oblongifolia, Ovalifolia, Brasiliensis and Excelsa.

Notwithstanding that all the British Colleges agree in the botanical species of *Cinchona*, from which the commercial varieties of bark are derived, there is no satisfactory evidence that they are right; on the contrary, it is almost certain that in regard to some of them they are wrong. I have been led to this conclusion chiefly from an accurate perusal of the work of M. Von Bergen *, a drug broker in Hamburgh, which is the most perfect specimen of pharmacography that has been published. He describes eight commercial varieties of cinchona bark.

1. China rubra: *Germ.* Rothe China. *Span.* Quina roxa; Quina colorada. *French*, Quinquina rouge. *English*, Red bark. It occurs both in flat pieces and in quills. It is all imported into Europe by way of Cadiz, in whole chests, never in seronnes. It is generally ascribed to the *Cinchona oblongifolia*, but M. Von Bergen is satisfied that this is an error, and that it is not yet ascertained what species of *Cinchona* yields the red bark of commerce. 1*st*, Red bark is described by Ruiz and Pavon, but neither of these botanists knew the species from which it was obtained. 2*d*, The bark of the *C. oblongifolia*, (*Quina roxa*, or *Flor de Azahar* of Santa Fé,) is repeatedly mentioned by them as quite different from the commercial red bark, (*Quina colorada.*) 3*d*, Von Bergen found in Ruiz's collection of barks specimens from *C. oblongifolia*, so different from our red bark, that they could not possibly come from the same species. 4*th*, These specimens were identical with the common *Cinchona nova* of Santa Fé. See No. 5.

2. China Loxa: *Germ.* Kron-China. *Span.* Quina de Loxa; Q. de Loxa corona; Cascarilla fina; C. fina de Uritusinga. *French*, Quinquina couronne; Q. de Loxa. *English*, Crown bark. Occurs always in quills, never in flat pieces. M. Von Bergen agrees with other authors in considering it to be ascertained that crown bark is the bark of the *Cinchona Condaminea* of Humboldt.

3. China Huanuco: *Germ.* Graue China. *Span.* Quina provinciana; Q. Huanuco; Q. Guanuco; also frequently Q. Huamalies. *French*, Quinquina Huanuco; Q. gris. *English*, Silver Huanuco. Occurs in quills; no proper flat pieces. Von Bergen considers the species furnishing this variety as not yet ascertained, and rejects the opinion of Hayne, who ascribes it to the *Cinch. cordifolia*, and of M. Virey, who gives it to the *Cinch. glandulifera*.

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* Versuch einer Monographie der China. 4to, Hamburgh, 1826. With eight coloured plates, and ten tables, imperial folio.

4. China Regia: ***Germ.*** Königs-China. ***Span.*** Quina Calisaya. ***French,*** Quinquina Calisaya; Quinq. royal. ***English,*** Yellow-bark. Occurs in quills and flat pieces, the latter consisting almost entirely of splint. This variety is commonly ascribed to the *Cinchona lancifolia;* but Von Bergen found in the Ruiz collection barks from *C. lancifolia, C. lanceolata,* and *C. nitida,* all of which were entirely different from our yellow bark, and which proved that it was not the bark of any of these species. See No. 9.

5. China flava dura: *Germ.* Harte gelbe China. *Span.* Quina de Santa Fé; Q. de Cartagena dura. *French,* Quinquina de Carthagène ou flava dur. *English,* Hard Carthagena bark. Occurs in quills and flat pieces, and is ascertained to be produced by the *Cinchona cordifolia.*

6. China flava fibrosa: *Germ.* Holzige gelbe China. *Span.* Quina de Santa Fé, or Q. de Cartagena lenosa, (fibrosa.) *French,* Quinquina de Carthagène fibreux, ligneux. *English,* Woody Carthagena bark. The species furnishing this variety is not ascertained; but the two kinds of Carthagena bark are often confounded, and have got a variety of names, as *China Bogotensis, Ch.* of Santa Fé, *Ch.* of Havanna, *China amarilla, Ch. naranjada, Quinquina orangé, China lutescens, &c.*

7. China Huamalies: *Germ.* Braune China. *Span.* Quina Huamalies, or Huanuco. *French,* Quinquina Huamalies. *English,* Rusty bark. The species furnishing this variety is unknown.

8. China Jaen: *Germ.* Blasse Ten-China. *Span.* Quina piura. *French,* Quinquina Jean. *English,* Ash bark. Is the bark of the *Cinchona ovata* or *pubescens* of Vahl.

9. China pseudo-loxa: *Germ.* Dunkele Ten-China,—only of late distinguished in Hamburgh as a distinct variety, but has probably been long sold as crown bark, to which it has much external resemblance. It is the bark of the *Cinchona lancifolia* of Mutis, of which *C. nitida* and *lanceolata* are synonyms.

Three kinds of cinchona bark are mostly used in this country.

1. *Pale Bark.*—In commerce, we have several varieties of the common pale bark, the most remarkable of which are the quilled bark, which comes from Loxa, and the flat bark, from Guanaco.

The bark which comes from Loxa consists of thin, singly or doubly rolled pieces, four or five inches long, and scarcely a line in thickness; externally rough, of a greyish brown colour, and generally covered with a kind of lichen; internally of a cinnamon colour. Its fracture should not be fibrous or powdery, but even and shining. It has a peculiar aromatic smell, and a pleasant bitter astringent taste. In commerce it is known by the name of *Crown Bark,* and is No. 2. of Von Bergen.

The bark which comes from Guanaco consists of much thicker, coarser, and flatter pieces ; externally of a dark brown or almost black colour, but internally it has the same cinnamon colour ; and in its resinous fracture, smell, and taste, it exactly resembles the former. It is No. 3. of Von Bergen. When genuine, both varieties are excellent remedies.

2. *Yellow Bark.*—Yellow bark consists of pieces about six inches in length, thicker, and less rolled up than the crown bark. Its internal surface is of a deeper red. It sometimes wants the epidermis, which is often as thick as the bark itself. It is lighter and more friable than the former variety ; its fracture is fibrous ; and when reduced to powder, its colour is paler. Its taste is much more bitter, astringent, and stronger ; but its smell is weaker. Its decoction, when hot, is redder ; but when cold, paler. Its solution strikes a deeper colour with sulphate of iron. It contains less gum than the pale, and less resin than the red bark. It is said to be much more powerful than either ; according to Mutis, it is the only one which is directly febrifuge ; and we are informed by Humboldt, it is that which is most esteemed at Loxa, and known by the name of *Cascarilla fina.* It is No. 4. of Von Bergen.

3. *Red Bark.*—It occurs generally in much larger, thicker, flatter pieces, but sometimes also in the form of quills. It is heavy, firm, sound, and dry ; friable between the teeth ; does not separate into fibres ; and breaks, not shivery but short, close, and smooth. It has three layers : the outer is thin, rugged, of a reddish brown colour, but frequently covered with mossy matter ; the middle is thicker, more compact, darker coloured, very resinous, brittle, and yields first to the pestle : the inmost is more woody, fibrous, and of a brighter red. Its powder is reddish, like that of Armenian bole. Its astringency and bitterness are more intense, and it contains more resin than the pale bark. It is not, however, allowed by Mutis to be, like the yellow bark, directly febrifuge. It is said to be more frequently adulterated. It is No. 1. of Von Bergen.

Our yellow bark (*China regia* of the Continent) is often confounded with our Carthagena bark, (*China flava* of the Continent,) and as the latter is scarcely a sixth part of the price of the former, it is often substituted for the more valuable. Their distinctive characters, therefore, deserve to be pointed out. The taste of the true yellow cinchona is much more bitter than that of the Carthagena: when the bark is present, for what is called bark often consists entirely of splint, it is in the yellow of considerable thickness, and the epidermis, when not covered with lichens, is of a dark brown colour, and the red fibres of the true bark may be seen shining through it. The epidermis of the Carthagena is, on the contrary, very thin, and always covered with dirty white and ochre yellow spots, which are never observed on the yellow. When the bark is absent, the Carthagena splint has a much lighter colour than that of the true yellow bark.

The great price of cinchona bark has sometimes tempted dishonest men to adulterate it with other similar and less powerful barks. M. Merat was the first to suggest the advantage that might be derived from the cryptogamic plants, which cover the epidermis of cinchona and other foreign barks, in distinguishing the genuine from the spurious varieties, as well as the sound from the decayed. His idea has been followed up by Von Bergen; and M. Fee has produced a splendid quarto volume on the subject. Although unsurmountable obstacles present themselves to the ascertaining with certainty the parasites of each kind of cinchona, we may suspect the goodness of barks on which a *Hypochnus*, a fungus, is found; and we should reject altogether those which support *Himantias*, a fungus, *Rhizomorphas*, *Lycoperdons*, and lichens of the genera *Collema* and *Jungermannia*. On the contrary, we may safely admit barks etched by *Graphides*, and eaten away by *Lecanores*.

Cinchona bark is even adulterated with genuine bark, from which the active constituents have been entirely extracted, by decoction with water.

In selecting cinchona bark, we must therefore take care, that besides the characteristics already noticed, it be dense, heavy, and dry, not musty, or spoiled by moisture, and that a decoction made of it have a reddish colour when warm, but when cold become paler, and deposite a reddish sediment. Those pieces whose taste is simply intensely bitter or very astringent, or nauseous, or merely mucilaginous, whose surface is smooth or polished, of a dark colour, or pale yellow, or red, which are tough or spongy, whose fracture is fibrous, woody or powdery, and their internal colour white or grey, are to be rejected. It is still more difficult to know genuine cinchona bark in the form of powder. Indeed it is said that it is scarcely possible to meet with genuine powder of cinchona; for it cannot be rendered sufficiently fine by means of a pestle and mortar; and when an apothecary is even at the trouble to select good bark, and sends it to a bark-mill, he must depend upon the accuracy of many individuals for receiving back the very article he sent.

There are few vegetable substances which have been subjected to analysis more frequently, and by abler chemists, than the cinchona bark. But from the difficulty of the subject, and from essential differences in the chemical properties of several varieties confounded under one denomination, contradictory results have arisen, and our knowledge of the subject was still imperfect, until 1821, when MM. Pelletier and Caventou made cinchona and some congenerous barks the subject of the most perfect specimen of vegetable analysis which has ever appeared.

The earlier experiments were, as usual, directed to ascertain the quantity of soluble matter in different menstrua. Dr Irving obtained from cinchona a small portion of volatile oil, on which its aroma depends. Fabbroni observed, that cinchona loses its solubility by long exposure to the air, and even by being reduced to very fine powder; 100 parts of cinchona, when bruised, yielding from 12 to 16 of extract, and when finely powdered only 6 or 7. Dr Lewis observed, that the decoction became turbid on cooling, and that the precipitate was soluble in alcohol. He also pointed out the deep green colour which decoctions of cinchona acquire from the addition of chalybeates. Dr Irvine afterwards found, that recent decoctions gave a black colour, while those which had been kept some time gave a green. It was long believed that cinchona was a powerful astringent; but after Seguin's discovery of gelatine as a test of the principle of astringency, Dr Maton found that cinchona contained very little tannin.

Deschamps obtained from yellow bark a considerable quantity of a saline matter, which was afterwards ascertained by Vauquelin to consist of lime, and a new acid to which he has given the name of *Kinic acid;* but as this would lead us to suppose that it was obtained from Kino, it appears to me that it ought to be named *Cinchonic acid*, from the systematic name of the tree, from whose bark it has been first obtained *.

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* This suggestion has been before the public since 1808, and has been noticed by Dr A. T. Thomson in his deservedly popular London Dispensatory; but Mr Brande must have been unacquainted with his having been so long anticipated, in a matter, indeed, of little importance, when, in 1825, he thought it worth while to add, as a foot note upon *Kinic acid*, in his Manual of Pharmacy, " This appellation so associates itself in the mind with Kino, that I should suggest Cinchonic acid as preferable."

Dr Maton discovered and published, in some of the medical journals, that infusion of cinchona was precipitated by infusion of nut-galls. Seguin, who afterwards made the same observation, concluded from it that cinchona contained gelatine; and he and some other French and Italian physicians, believing the febrifuge virtue of cinchona to reside in gelatine, gave clarified glue in intermittent fevers as a substitute. M. Seguin's opinion appeared to me highly improbable; and I published in Nicholson's Journal, in 1803, some experiments, which sufficiently proved that cinchona does not contain gelatine. Infusion of galls was precipitated copiously, not only by the filtered decoction of cinchona, but also by the infusion, and by the tincture diluted and filtered; and as these phenomena were inconsistent with the properties of gelatine or starch, (the only other principles which were then known to precipitate infusion of galls,) I conceived myself authorised to ascribe them to a distinct vegetable principle, not hitherto examined, soluble in alcohol and in water, and called it *Cinchonine* *.

Dr Gomez prosecuted the subject with success, and first separated cinchonine in a crystalline form, and has described its properties in a state of tolerable purity. His general conclusions were, 1*mo*, That the crystals are a pure vegetable principle. This appears from the regular and crystalline form which they assume, from their complete solubility in sulphuric acid, and from the precipitate which potassa forms in this solution having the same properties as the crystals. 2*do*, That this pure principle is the cinchonine of Dr Duncan, since it gives, with the infusion of galls, a white precipitate capable of being dissolved by alcohol. 3*tio*, That this principle, in its insolubility in water, its inflammability and solubility in alcohol and ether, bears some analogy to resin, but differs from it by its crystallization and solubility in the acids. 4*to*, That by these last properties it is somewhat analogous to camphor, from which it differs, however, in being without odour; in being precipitated crystallized from the alcoholic solution; in having greater specific gravity, since it sinks in water; in giving a precipitate with the infusion of galls, &c. 5*to*, That, by having singular and peculiar properties, it is, as Dr Duncan thought, a vegetable principle different from all others hitherto known.

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* These experiments were overlooked by chemists in general. M. Gomez was, however, induced by them to prosecute the subject; and in the Transactions of the Royal Academy of Lisbon, he published a very able memoir, in which he pointed out the method of procuring cinchonine, and ascertained many of its properties and combinations. A very imperfect abstract of M. Gomez's memoir was published in the *Annales de Chimie*, and the translator suppressed those passages in which M. Gomez himself did me ample justice. In consequence of this, the French and other chemists ascribed to M. Gomez the discovery of a peculiar vegetable principle in cinchona, and the distinguishing it, by a proper name, cinchonine. I certainly did regret that I was thus deprived of the honour of having my name associated with those of the distinguished chemists who have at last rendered the subject one of great and general interest; and I took an opportunity of writing to M. Pelletier, who has, in the handsomest manner publicly, in the *Journal de Pharmacie*, admitted the justice of my claims, and he has been followed by Thenard, and other competent judges.

Another remarkable property of some kinds of cinchona, that of precipitating tartar-emetic, was discovered by Cornette, who found that an infusion of one ounce of cinchona decomposed one scruple of tartar-emetic, and was entirely deprived of its colour and bitter taste, while the antimonial lost its emetic property; but, according to Fabbroni, the cinchona preserved its febrifuge virtues.

Vauquelin, in a more recent examination of various cinchona barks, has shewn that there are three, if not four classes of cinchona bark, differing essentially in chemical constitution: but unfortunately he has not been able to designate, with botanical accuracy, the individual varieties he found to belong to each.

The first class precipitate astringents, but not gelatine.

The second precipitate gelatine, but not astringents.

The third precipitate both astringents and gelatine. And,

Lastly, some barks confounded with these precipitate neither astringents nor gelatine; but these, Vauquelin, viewing the genus chemically, does not consider as cinchonas.

M. Seguin, it appears, has now seen his error in supposing that cinchona contained gelatine, though without retracting it, and has published two additional memoirs upon cinchona, in which he says, that hitherto apothecaries had only the external appearance, fracture, taste, and smell, to enable them to judge of the quality of cinchona; but that these characters are insufficient, and that it is only by means of chemical tests that we can ascertain the presence or proportion of the febrifuge principle. He gives with confidence the following criterions:

1. Cinchona, if good, precipitates the solution of tannin, but not those of gelatine or of sulphate of iron.

2. The precipitate which the febrifuge principle forms with the solution of tan is reddish, slightly flocculent, and heavy. If the precipitate be considerable and sink quickly, it is a proof that the febrifuge principle is abundant, and of good quality. If it be not very decided, and remain suspended in the liquor, only disturbing its transparency, it is a proof that it is scanty, and of bad quality.

3. If it does not precipitate the solution of tannin, it is a proof that it does not contain any febrifuge principle.

The application of these tests he describes as easy. He powders a drachm of cinchona, infuses it for half an hour in two ounces of boiling water, decants and filters the infusion. The solution of tannin is prepared by mixing two ounces with three ounces of cold water, and filtering it. A solution, of nut-galls may be substituted, but it is rather too delicate. The solution of gelatine is made by dissolving an ounce of fine glue in three ounces of water in a sand bath, and filtering it through fine linen; the solution of sulphate of iron, by dissolving an ounce in two ounces of water. A little of the infusion of cinchona is put into a glass, and the re-agents added drop by drop.

The analysis of the various cinchona barks has been completed by MM. Pelletier and Caventou. They have ascertained the real nature of the febrifuge principle, and have found it to be one of those substances lately discovered in the vegetable kingdom, which possess certain properties of alkalies, and upon which their peculiar virtues chiefly depend. To obtain cinchonia in a state of purity, they form a tincture of the pale bark in boiling alcohol; distil off the alcohol to dryness; dissolve the extract in water strongly acidulated with muriatic acid; add to the solution calcined magnesia in abundance, and boil a few minutes; wash the precipitates repeatedly with cold water; subject it to the action of boiling alcohol, and evaporate the tincture, which furnishes cinchonia in acicular crystals.

Cinchonia is white, transparent, crystallizable; soluble in 700 cold waters; soluble in alcohol and acids, forming with some of them crystallizable salts. Its elementary principles are carbon, hydrogen and oxygen.

Quinia, another alkaloid, which differs from cinchonia as potass does from soda, is obtained by the same process from the yellow bark. It is white, not crystallizable, but forms amorphous transparent plates. It is less insoluble in water, and the salts it forms with acids are different. The sulphate is now extensively used in the practice of medicine.

The red bark contains both these alkaloids, which exist in combination with an excess of the cinchonic acid discovered by Vauquelin.

M. Von Sanden of Hamburgh, who is extensively engaged in the manufacture of the sulphate of quinia, and in extracting cinchonia, has given, in Von Bergen's Monography, a detailed account of the products of a number of parcels of each variety. I have drawn up the following table of the average obtained from 100 lb. of each of the following kinds:

	Cinchonia.	Sulphate of Quinia.	Total.
Yellow, heavy,	℥ 0	24.5	24.5
——— light,	0	12.5	12.5
Crown,	0	4.7	4.7
Red,	23.3	5.9	29.2
Carthagena, hard,	6.8	3.8	10.6
——— woody,	4.8	4.4	9.2
Huamalies, (rusty,)	14.3	0	14.3
Huanuco,	33.5	0	33.5

Clinical experiments first made by MM. Double, Chomel and Villermet, and since repeated by many practitioners as well as myself, have established that these alkaloids are eminently febrifuge, and constitute in fact the febrifuge principle of the true cinchona barks.

The other principles, found in the cinchona barks, whose properties have been ascertained by MM. Pelletier and Caventou, are,

1. An unctuous matter, obtained separate by M. Laubert, by means of sulphuric ether. It is very soluble in ether even cold; soluble in boiling alcohol, partly deposited on cooling, and forms a soap with alkalies. When got from pale bark it has a green colour, probably owing to the presence of a little *chlorophylle;* from the other barks it is not green.

2. Cinchonic red of M. Reuss; without taste or smell; of a brown red colour; soluble in considerable quantity in alcohol, especially warm; little acted on by ether; soluble in small quantity in boiling water; very soluble in concentrated acetic acid, but separated by dilution; neither alone nor combined with an acid, precipitating gelatine; precipitating tartar emetic; very soluble in cold alkaline fluids, and having its colour greatly deepened; precipitated from its alkaline solutions by acids, but modified, as it now precipitates gelatine.

3. A soluble red matter, a variety of the tanning principle, which precipitates gelatine and starch, and gives a green colour to red salts of iron. The much greater solubility of the tannate of starch, at an increased temperature, is the cause of the decoction of bark turning turbid on cooling.

4. A yellow colouring principle, possessed of no remarkable properties.

5. Cinchonic acid, (kinic acid of Vauquelin,) united partly to the alkaloid, and partly to lime.

6. Starch; and 7. Lignine.

MM. Pelletier and Caventou consider it impossible to give a *quantitative* analysis of so complex a substance as cinchona bark; but they observe,

1. That the salifiable base exists in less quantity in the pale than in the yellow bark, as they got only two grammes of cinchonia from the kiligramme of the former, and nine grammes of quinia from the latter.

2. That the quilled red bark contains both salifiable bases in much greater quantity than either of the others, as a kiligramme yielded eight grammes of cinchonia and seventeen grammes of quinia.

3. That the cinchonic red seems identical in all the varieties. It is most abundant in the red, and least in the pale bark.

4. That the tanning principle is less abundant in the yellow than in the pale or red, and differs a little in each.

5. That gum is found in the pale bark only.

6. That the cinchonate of lime and other principles seems identical in all.

Med. use.—On dead animal matter cinchona bark acts as an antiseptic; and on the living body it acts moreover as a stimulant, tonic, and antispasmodic.

On its first introduction into Europe, it was reprobated by many eminent physicians; and at different periods long after it was considered as a dangerous remedy; but its character, in process of time, became universally established, and at one time it was thought so indispensable to the cure of many diseases, that the British Government was accused of barbarity in preventing their enemies from getting it. Now, by one of those singular revolutions to which human opinion is liable, it has again fallen into great disuse.

It was first introduced for the cure of intermittent fevers; and these, when it is properly exhibited, it rarely fails to cure. Humboldt says, that in intermittent fevers, the bark of the *C. condaminea* and *C. lancifolia* are preferable to the others; while in diseases of the muscles and purulent ulcers *C. oblongifolia* is more fitted, and the milder *C. cordifolia* is adapted for convalescents. There has also been considerable difference of opinion with regard to the best mode of exhibition; some prefer giving it just before the fit, some during the fit, others immediately after it. Some, again, order repeated doses between the fits; and this mode of exhibition, although it may perhaps sometimes lead to the employment of more bark than is necessary, upon the whole appears preferable, from being best suited to most stomachs. The requisite quantity is very different in different cases; and in many vernal intermittents, cinchona seems even hardly necessary.

It is now given from the very commencement of the disease, without previous evacuations, which, by retarding the cure, often seem to induce abdominal inflammations, scirrhus, jaundice, hectic, dropsy, &c.; symptoms formerly imputed to the premature or immoderate use of the bark, but which are best obviated by its early and liberal use. It is to be continued not only till the paroxysms cease, but till the natural appetite, strength, and complexion return. It is then to be gradually left off, and repeated at proper intervals to secure against a relapse; to which there often seems to be a peculiar disposition, especially when the wind blows from the east. Although, however, evacuations rather counteract the effects of cinchona in the cure of intermittents, yet previous to its use, it is advisable to empty the alimentary canal, particularly the stomach; and on this account good effects are often obtained from premising an emetic.

It is a medicine which seems not only suited to both formed and latent intermittents, but to that state of fibre on which all periodical diseases seem to depend; as periodical pain, inflammation, hæmorrhagy, spasm, cough, loss of external sense, &c.

Cinchona was at one time used by some in all continued fevers; at the same time attention was paid to keep the bowels clean, and to promote when necessary the evacuation of redundant bile, always, however, so as to weaken the patient as little as possible. Now it is scarcely ever given, and the cure is essentially antiphlogistic.

In confluent small-pox, it promotes languid eruption and suppuration, diminishes the fever, and prevents or corrects putrescence and gangrene.

Dr Haygarth has extolled its use in acute rheumatism, from the very commencement, even without premising venesection.

In gangrenous sore throats, and indeed in every species of gangrene, it is much used, both externally and internally.

In contagious dysentery, after due evacuation, it has been used, taken internally and by injection, with and without opium.

In all those hæmorrhagies called passive, and likewise in other increased discharges, it is much used; and in certain undefined cases of hæmoptysis, some allege that it is remarkably effectual when joined with an absorbent.

It is used for obviating the disposition to nervous and convulsive diseases; and some have great confidence in it, joined with sulphuric acid, in cases of phthisis, scrofula, ill-conditioned ulcers, rickets, scurvy, and in states of convalescence. In these cases, it is proper to conjoin it with a milk diet.

In dropsy, not depending on any particular local affection, it is often alternated or conjoined with diuretics or other evacuants; and by its early exhibition after the water is once drawn off, or even begins to be freely discharged, a fresh accumulation is prevented, and a radical cure obtained.

Mr Pearson of the Lock Hospital praises very highly the powers of this remedy in different forms of the venereal disease; in reducing incipient bubo, in cleansing and healing ulcers of the tonsils, and in curing gangrenous ulcers from a venereal cause. But in all these cases mercury must also be given to eradicate the venereal virus from the system.

Peruvian bark may be exhibited,

1. *In substance.* The best form of exhibiting this valuable remedy is in the state of a very fine powder, in doses of from ten grains to two drachms and upwards. Mutis and Zea say, that two drachms of true yellow bark in powder are sufficient to prevent the access of an intermittent, while, to produce the same effect, it requires the decoction of two ounces. As it cannot be swallowed in the form of a dry powder, it must either be diffused in some liquid, as water, wine, or milk, or mixed with some viscid substance, as currant jelly. Its taste, which is disagreeable to many people, is best avoided by taking it immediately after it is mixed with the vehicle. In this respect, therefore, it is better for the patients to mix it up themselves, than to receive it from the apothecary already made up, into a draught with some simple distilled water, or into an electuary with a syrup. A much more important objection to giving cinchona in substance is, that some stomachs will not bear it, from the oppression, and even vomiting, which in these cases it excites. We must endeavour to obviate this inconvenience by the addition of some aromatic, and by giving it in small doses more frequently repeated.

2. *In infusion.* To those whose stomachs will not bear the powder, this is a good form of exhibiting cinchona bark. Water at a given temperature seems capable of dissolving only a certain quantity of its active constituents, and therefore we are not able to increase the strength of an infusion, either by employing a larger quantity of the bark, or allowing them to remain longer in contact. One part of bark is sufficient to saturate sixteen of water in the course of an hour or two. To accelerate the action of the water, it is usual to pour it boiling hot upon the bark, to cover it up, and allow it to cool slowly. After standing a sufficient length

of time, the infusion is decanted off for use. The infusion in water is however liable to one very great objection, that it cannot be kept even a very short time without being decomposed and spoiled.

3. *In decoction.* Water of the temperature of 212° is capable of dissolving a much larger proportion of some of the principles of cinchona bark than water at 60°. But the solvent powers even of boiling water have their limits, and by protracting the decoction we do not increase its strength, but rather, by diminishing the quantity of the menstruum, we lessen the quantity of matter dissolved. Besides, at a boiling temperature, some of the active constituents are dissipated, while others absorb oxygen rapidly from the atmosphere, and are converted into what seems to be an insoluble and inert substance.

4. *In tincture.* The great activity of the menstruum in this preparation, prevents the bark from being given in sufficiently large doses to exert its peculiar virtues. It is, however, a powerful tonic.

5. *In wine.* In some instances, we prepare the infusion with wine; and it fortunately happens that very often the use of the menstruum is as much indicated as that of the solvend. Cinchona also prevents wine from becoming acid, but in the course of a few days throws down its colouring matter, as nut-galls and charcoal do.

6. *In extract.* In this preparation, we might expect to possess the virtues of cinchona bark in a very concentrated state. The principal objections to its use are its great expense, and the decomposition and destruction of the active constituents of the bark during the preparation, even when most carefully conducted. Not above half the weight of the dry extract is again soluble in water. It is convenient for the formation of pills and boluses, but we would always prefer a fresh infusion or decoction to any mixture in which the extract is redissolved.

Externally, cinchona bark is used in substance, as an application to ill-conditioned, carious, or gangrenous ulcers.

In the form of clyster it may be given in substance, decoction, or extract. The powder is used as a tooth powder for spongy and bleeding gums, and the decoction is an excellent astringent gargle or wash.

To increase the power of cinchona bark, or to direct its efficacy to a particular purpose, or to correct some inconveniences occasionally produced by it, it is frequently combined with other remedies. When it produces vomiting, carbonic acid forms a useful addition; when it purges, opium;

when it oppresses the stomach, aromatics; and when it induces costiveness, rhubarb. But we are afraid that many additions are made, chiefly saline substances, of which the effects are not at all understood. Sulphuric acid, super-sulphate of alumina and potass (alum,) muriate of ammonia, carbonate of potass, tartrate of potass, tartrate of antimony and potass (tartar-emetic,) iron, lime-water, astringents, &c. have been frequently prescribed with it; but we know that in many of these mixtures decomposition occurs, which renders the whole either inactive, or completely deceives us with regard to the expected effects.

Off. Prep. of the pale bark.—Infus. cinchonæ, *L. E. D.* Decoct. cinchonæ, *L. E. D.* Extractum cinchonæ, *L. E. D.* Extr. cinch. resinosum, *L.* Tinctura cinchonæ, *L. E. D.* Tinct. cinch. comp. *L. E. D.* Tinct. cinch. ammoniata, *L.* Mistura ferri aromatica, *D.* Vinum gentianæ comp. *E.*

Off. Prep. of the yellow bark.—Quininæ sulphas, *D.*

CINNAMOMUM. *Lond. Dub.* See LAURUS.

CITRUS.

Willd. *g.* 1391; Spr. *g.* 2617; *Polyadelphia Icosandria.*—Nat. ord. *Pomaceæ*, Linn., *Aurantiaceæ*, Juss.

Spr. *sp.* 4. CITRUS AURANTIUM. *Ed. Dub. Var.* Hispalense. *Lond.*

Seville orange *.

Off.—The fruit, juice and rind of the fruit, unripe fruit, and distilled water of the flowers.

a) AURANTII BACCÆ. *Lond.* CITRI AURANTII SUCCUS. Fructus succus. *Ed.* FRUCTUS SUCCUS. *Dub.*

b) AURANTII CORTEX; baccarum cortex exterior. *Lond.* CITRI AURANTII CORTEX. Cortex exterior fructus. *Ed.* TUNICA EXTERIOR. *Dub.*

c) FLORES. *Dub.*

d) FOLIA. *Dub.*

THE orange tree is a beautiful evergreen, a native of Asia, but now abundantly cultivated in the southern parts of Europe, and in the West-India islands. There are many varieties of this species, but they may be all referred to the Bitter or Seville orange, and the Sweet or China orange.

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* *Syn.* L'oranger, (*Fr.*) Die Pomeranzenbaum, (*Ger.*) Melarancino, (*It.*) Kichlie pullum, Collungie pullum, (*Tam.*) Naringhie, (*Duk.*) Nárúnge, (*Hind.*) Kichidie pundoo, (*Tel.*) Jéroc manis, (*Mal.*) Jeruk-legi, (*Jav.*) Jaruk manis, (*Bal.*) Cay-cam, (*Cochin-Chin.*) Panneh dodang, (*Cyn.*) Fnemp, (*Japan.*) Nága runga, (*Sans.*) Saku limba, (*Mah.*)

The juice of oranges is a pleasant acid liquor, consisting principally of citric acid, syrup, extractive, and mucilage.

The outer yellow rind of the fruit is a grateful aromatic bitter.

The unripe fruit dried are called Curaçoa oranges. They vary from the size of a pea to that of a cherry. They are more bitter than the rind of ripe oranges, but not so aromatic, and in tincture are used as a stomachic.

The leaves are neither so aromatic nor so bitter as the rind of the fruit.

The flowers *(flores naphæ)* are highly fragrant, and have long been in great esteem as a perfume and as a condiment; their taste is somewhat warm, accompanied with a degree of bitterness. They yield their flavour in distillation both to spirit and to water *(aqua florum naphæ.)*

A very fragrant red-coloured oil, distilled from these flowers, is brought from Italy, under the name of *Oleum* or *Essentia Neroli;* but oil of behen, in which orange flowers have been digested, is frequently substituted for it: the fraud, however, is easily detected, as the real oil is entirely volatile, and the adulterated is not.

Med. use.—The leaves have been celebrated by some as a powerful antispasmodic in convulsive disorders, and especially in epilepsy; with others they have entirely failed. Orange flowers were at one time prescribed in convulsive and epileptic cases; but experience has not confirmed the virtues attributed to them. The juice of the fruit is of considerable use in febrile or inflammatory distempers, for allaying heat, and quenching thirst, and acts as a specific in genuine scorbutus, or sea-scurvy. Although the Seville, or *bitter orange* as it is called, is the officinal variety, yet the China, or sweet orange, is much more employed. Its juice is milder, and less acid. Dr Wright applied the roasted pulp as a poultice to fetid sores, in the West Indies, with very great success. An excellent confection, marmalade, is made of the juice and rind of the Seville orange.

The rind proves an excellent stomachic and carminative, promoting appetite, warming the habit, and strengthening the tone of the viscera.

The small unripe oranges dried are used, instead of peas, to keep up the discharge in issues.

Off. Prep. of the rind dried.—Conserva citri aurantii, *L. E.* Aqua citri aurantii, *E.* Syrupus aurantii, *L. D. E.* Infusum aurantii comp. *L. D.* Tinct. aurantii, *L.* Tinct. cinchonæ comp. *L. E. D.* Tinct. gentianæ comp. *L. D.* Spiritus armoraciæ comp. *L. D.* Inf. gentianæ comp. *D. E. L.*

Spr. *sp.* 8. CITRUS MEDICA. *Ed. Lond. Dub.*
Lemon tree *.

Off.—The juice and the outer rind of the fruit, and the volatile oil of the outer rind.

a) CITRI MEDICÆ SUCCUS. Succus fructus. *Ed.* LIMONES, baccæ. *Lond.* SUCCUS FRUCTUS. *Dub.*

b) CORTEX CITRI MEDICÆ. Cortex exterior fructus. *Ed.* LIMONUM CORTEX. Baccarum cortex exterior. *Lond.* TUNICA EXTERIOR. *Dub.*

c) CITRI MEDICÆ OLEUM VOLATILE ex cortice fructus. *Ed.* OLEUM VOLATILE TUNICÆ EXTERIORIS. *Dub.* OLEUM LIMONUM. Corticis exterioris oleum essentiale. *Lond.*

THE juice of lemons is analogous to that of oranges, from which it only differs in containing more citric acid and less sugar. The quantity of the former is indeed so great, that the acid has been named from the fruit, Acid of Lemons, and is always prepared from it. The expressed juice will not keep, on account of the sugar, extractive, mucilage, and water, which cause it to ferment.

The peel yields by expression or distillation with water an essential oil, which is much used in perfumery.

Med. use.—Fresh lemon juice is truly specific in the prevention and cure of scurvy; that is, its effects are certain and cannot be explained; for the crystallized acid, and even the rob or inspissated syrup, do not produce the same salutary effects. It is given freely mixed with water and sugar, and in a short time the symptoms disappear.

Lemon juice is also a powerful and agreeable antiseptic. Its powers are much increased, according to Dr Wright, by saturating it with muriate of soda. This mixture he recommends in dysentery, remittent fever, the bellyach, putrid sore throat, and as being perfectly specific in diabetes, (but it cannot be our diabetes,) and lienteria. Citric acid is often used with great success for allaying vomiting, mixed with subcarbonate of potass, in the form of an effervescing draught. This mixture should be drunk as soon as it is made; or by first swallowing the subcarbonate of potass dissolved in water, and drinking immediately afterwards the citric acid properly sweetened, the carbonic acid gas, on which its anti-emetic power chiefly depends, may be extricated in the stomach itself. The doses are about a scruple of the subcarbonate dissolved in eight or ten drachms of water, and an ounce of lemon juice, or an equivalent quantity of citric acid.

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* *Syn.* Citronier, (*Fr.*) Der Zitronenbaum, (*Ger.*) Cedra, limon, (*It.*) Elimitchum pullum, (*Tam.*) Jerook, (*Mal.*) Neemboo, (*Duk. Hind.*) Nemmapundoo, (*Tel.*) Dehi, (*Cyng.*) Jambhhīra, (*Sans.*) Korna neboo, (*Beng.*) Cay-Tanh-yen, (*Coch. Chin.*)

Lemon juice is also an ingredient in many pleasant refrigerant drinks, which are of very great use in allaying febrile heat and thirst. Of these the most generally useful is lemonade, or diluted lemon juice, sweetened.

The rind is a bitter aromatic, and is frequently employed in stomachic tinctures and infusions.

Off. Prep. of the juice.—Acidum citricum, *L. D.* Syrupus limonis, *L. E. D.* *Of the rind.*—Infusum aurantii comp. *D. L.* Infus. gentianæ comp. *D. L.*

COCCULUS.

De Candolle *Systema,* Nat. ord. *Menispermeæ veræ,* Linn. *Sarmentaceæ;* Willd. *Menispermum, g.* 1826; *Diœcia dodecandria;* Spr. *g.* 1382, *Hexandria trigynia.*

THE genus *Cocculus* has been established by De Candolle to include the hexandrous species of the genus *Menispermum* of Linnæus, which De Candolle has limited to those species which have twelve stamens and upwards. On the other hand, Sprengel has transferred the whole species, including those having many stamens, to the class *Hexandria,* without paying any regard to the greater number of them being dioicous. The Colleges follow De Candolle.

Sp. 12. *De C.* COCCULUS SUBEROSUS. *Dub.* MENISPERMUM COCCULUS. *Ed.*

Cocculus Indicus. Jagged moonseed *.

Off.—The berry.

FRUCTUS vulgo Cocculi Indici. *Dub.* MENISPERMI COCCULI BACCÆ. *Ed.*

THE cocculus indicus is a berry, or rather a baccated drupe, which is brought from the coast of Malabar. There is still some doubt as to the species furnishing the officinal seed, and it is not improbable that those of several allied species possess similar virtues. M. Fee refers to the *C. Plukenetii* as furnishing them, as well as the *suberosus;* but De Candolle distinctly says, the fruit of the former is very like the officinal article, but one-third of the size. The C. suberosus is considered as the source of the officinal fruit, on the authority of Roxburgh, who raised it from genuine seeds got from Malabar. The C. lacunosus, which also furnishes a similar berry, is a native of Celebes and the Molucca islands.

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* *Syn.* Grana orientis, (*Ruell.*) Galla orientis, (*Caes.*) Cuculi fructus, (*Cord.*) Baccæ coculæ Alexandrinæ, (*Math.*) Cocci orientales, (*Tab.*) Cocculæ officinarum, (*Bauh.*) Coccus piscatorius levantinas, (*Camell.*) Coque de Levant, (*Fr.*) Fischkörmer, (*Ger.*) Galla di Levante, (*It.*) Kakacollie verei, (*Tam.*) Kakichempoo vittiloo, (*Tel.*) Kakamari, (*Sans.*) Kakmāri ke beenge, (*Duk.*) Tuba bidij, (*Malay.*) Natsjatam, (*Hort. Mal.*)

The nuts are about the size of large peas, of a grey colour, and wrinkled surface. They contain a kidney-shaped seed, within a very thick shell. 4 ounces of the nut gave 1 ounce of the seeds. The shell has little taste. The seed is intensely and durably bitter. M. Boullay analysed them, and found them to contain about half their weight of a concrete waxy oil, albumen, a particular colouring matter, a bitter poisonous principle, *Picrotoxine*, lignine, and various saline matters. In later experiments, M. Boullay thought he had detected a peculiar acid, to which he has given the name of *Menispermic;* but it now appears to be malic acid, with a small proportion of sulphuric. Picrotoxine is obtained by digesting for a day a decoction of the berry upon caustic magnesia. It is then to be treated with alcohol, which dissolves out the picrotoxine, and this may be purified by evaporation and repeating the solution, and if much coloured, by the addition of animal charcoal. It has the form of quadrangular prisms, white, brilliant, semitransparent, and extremely bitter; it is soluble in 3 parts of alcohol, in 25 of boiling, and 50 of cold water. It is soluble in the common alkalies, and in acetic and weak nitric acid. It melts by heat, and chars. It contains no azote. Vauquelin got a substance very similar from the *Daphne alpina.* Picrotoxine resembles camphor in its action on the living system, but is much more powerful and deleterious.

Med. use.—The cocculus indicus is used, both in India and in this country, to intoxicate fishes, in order that they may be caught; and it is said to be employed by some porter brewers to give bitterness to their beer, and to render it more intoxicating. An ointment made with it has long been a domestic remedy in some places to kill vermin on the head, and is successfully applied in cases of tinea capitis, and in sycosis menti. This use of it is probably derived from the native practitioners of India, who beat it into a fine powder, and mix it with a little warm castor oil, as an application in cases of inveterate itch and herpes (impetigo?)

Dr Jaeger has lately used with success, in tinea capitis, a salve made of ten grains of picrotoxine rubbed up with an ounce of lard. An ounce and a half of the salve generally sufficed for a cure, which was effected in less than four weeks.

Sp. 22. De C. Cocculus palmatus. *Lond.*

Off.—Colombo *.

Colombæ radix. *Ed. Dub.* Calumbæ radix. *Lond.*

This root is produced in Africa, in the country of the Caffres, and forms an important article of commerce with the Portuguese at Mozambique, in the province of Tranquebar. M. Barbier says, " The plant (*Menispermum Columba* Roxb., *Cocculus palmatus* of De Candolle,) is perennial, dioicous, with a tuberous fusiform root, and a simple voluble stalk. Commerson saw it cultivated at the Isle of France, whither it had been brought from the coast of Africa or India. M. Forbin afterwards found it at Mozambique." It is generally brought in transverse sections, from half an inch to three inches in diameter, rarely divided across. This is evidently done to facilitate its drying; for the large pieces are all perforated with holes. The bark is wrinkled and thick, of a dark brown colour on the outside, and bright yellow within. The pith in the centre is spongy, yellowish, and slightly striped. Its smell is faintly aromatic, and readily lost when not preserved in close vessels; its taste is unpleasant, bitter, and somewhat acrid; the bark has the strongest taste; the pith is almost mucilaginous.

M. Planche has given a very detailed analysis of colombo root. He found it to contain, of bitter yellow extractive, 13; animo-vegetable matter, 6; volatile oil, a trace; starch, 33; mucus, 9; woody residuum, 39 = 100. But this analysis is still imperfect; for M. Planche concluded on the presence of animo-vegetable matter, partly from the copious precipitate made in the tincture with strong alcohol, by infusion of gall nuts; but no animo-vegetable matter is soluble in alcohol, especially after every thing soluble in water has been extracted. M. Planche did not at that time know that principles, strictly to be called vegetable, are precipitated by infusion of gall nuts. From the same experiment, made by myself, before I knew of M. Planche's observation, I enumerated cinchonine among the principles of colombo root. After my discovery of the peculiar principle in cinchona bark, I tried a variety of other drugs, to ascertain how widely it was diffused through the vegetable kingdom; and as at that time I considered that cinchonine alone possessed the properties of being soluble in alcohol, and of forming a precipitate with infusion of galls, I inferred that every substance possessing these properties contained cinchonine. It has, however, since been discovered, that these characters belong to several principles specifically distinct. They must now, therefore, be considered as only characterizing a class or order of principles; and it remains to be ascertained whether colombo contains the species now described under the name of cinchonine, or whether it owes its bitterness and active properties to another species of the family.

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* *Syn.* Racine de Colombo vraie, (*Fr.*) Kolumba wurzel, (*Ger.*) Colomba, (*It.*) Raiz de Columba, (*Port.*) Columboo vayr, (*Tam.*) Kalamboo khoo, (*Cyng.*) Columbakejur, (*Duk.*) Kalumb, (*Mosambique.*)

It is more probable that the bitter principle is allied to picrotoxine, which is the active constituent of another species of this genus.

Med. use.—Colombo is an excellent tonic bitter, and is much used, in the form of cold infusion, with supercarbonate of potass, in various cases of dyspepsia, especially when accompanied with acidity of the stomach. It is also given in vomiting, and in many affections of the intestines, as diarrhœa, dysentery, cholera, and in bilious diseases generally. In the bilious remittent and intermittent fevers of India, it is considered a valuable remedy. Sir E. Home sprinkled the powder upon foul ulcers as a detergent. Internally half a drachm of the powder may be given several times a-day.

Off. Prep.—Tinctura colombæ, *D. L. E.* Infusum colombæ, *D. L. E.* Mistura ferri aromatica, *D.*

Spurious colombo.

The root of an American plant, *Frasera Walteri* of Michaux, *Swartia Fraseri* of Smith, is imported into Liverpool, and dispersed over the north of Europe as the true colombo root. Professor Bigelow has briefly stated, that it may be distinguished from the true colombo "by its whiter colour, lighter texture, the admixture of longitudinal pieces, and especially by its taste, which is sweetish at first, and not more than half as bitter as the real colombo." M. Stolze of Halle has pointed out much more minutely the distinctions, both physical and chemical, of these two roots. The tincture of the genuine root was not affected by a solution of protosulphate or permuriate of iron, but afforded a copious dirty grey precipitate with tincture of galls; while, on the contrary, the tincture of the spurious root acquired a dark green from protosulphate and permuriate of iron, and gave no precipitate with tincture of galls.

In France, and probably in the south of Europe, another fraudulent substitution seems to be very common. Indeed, according to M. Guibourt, the true colombo root is no longer found in commerce. There is sold in its stead a spurious colombo, which is brought from the states of Barbary, and especially Algiers, to Marseilles. This last is easily known by its not containing starch; (iodine does not alter its colour); by its turning black with sulphate of iron; disengaging ammonia by the action of caustic potass; and by its infusion reddening tournesol paper:—all of which circumstances are foreign to the true colombo.

COCCUS CACTI. *Ed. Dub.* COCCUS, s. s. Coccus cacti. *Lond.* Cochineal.

COCHINEAL is the dried body of the female of a hemipterous insect. It is found only in Mexico, chiefly in the province of Oaxaia, on the leaves of a non-descript cactus, according to Humboldt. There are two kinds of the cochineal insect, which live on different species of cactus, &c. It is worthy of notice, that not only the fruit, but even the green joints of several species of cactus, dye cotton purple or red. The wild cochineal, *grana sylvester*, which is covered with a silky or cottony envelop, is less valuable than the cultivated or powdery cochineal, which is without that covering, grows to a larger size, and furnishes a finer and more permanent colour. From a very distant period, laws have existed against the adulteration of cochineal, and it is ordered to be exposed for sale in separate grains, not in agglutinated masses. Nearly a million of pounds are said to be brought annually to Europe. M. Fée found that five of the best quality weighed a grain, which gives 45,000 in a Paris pound. In commerce two kinds of fine cochineal occur; *Cochenille jaspée*, or *mestèque*, the *Cochinilla juspeada* of the Spaniards; and the other, *C. noire*, the *C. renegrida* or *Grana nigra.* The difference depends upon the former having been dried in a stove, whereas the latter has been subjected to the action of boiling water, and therefore the former is justly preferred to the latter, notwithstanding the observations of M. Boutron-Charlard. According to M. Guibourt, however, they are different species of the insect, and the black contains more carmine. The latter was preferred to the former, and, notwithstanding the observations of M. Boutron-Charlard, probably upon just grounds.

Cochineal has the form of hemispherical grains, flat or concave on one side, and convex on the other, and having some appearance of transverse rings, about a line in diameter, dry, light, friable, of a blackish red colour externally, sometimes covered with a white bloom. Powder of a purplish carmine colour; smell, especially when powdered, musty; taste musty like sourish old cheese; not liable to deterioration when properly kept. M. Fée says that falsification is impossible, for it must be detected by mere inspection. On the contrary, Dr Paris tells us, that cochineal is often adulterated by pieces of clay formed in moulds and coloured by cochineal. The fraud is easily detected by throwing a suspected sample into water, as the spurious grains dissolve. M. Boutron-Charlard has exposed another fraud. To give it the appearance of the jasper variety, black cochineal is left for thirty-six or forty-eight hours in a damp cellar. It is then put into a bag with finely powdered Venice talc. After shaking them together, the superfluous talc is removed by sifting, and the cochineal dried.

The cochineal insect has been carefully analyzed by John. He gives as its constituents 50 of a peculiar carmine red colouring matter in a soft state, 10.5 of gelatine, 10 of a waxy fat, 14 of a gelatinous mucus, 14 of membranes, and 1.5 of alkaline and earthy phosphates and muriates. The colouring matter, to which he has given the name of *Cochineline*, is soluble in water, alcohol, and ether, and is precipitated from its solutions by several of the earthy metallic salts. MM. Pelletier and Caventou have greatly extended our knowledge of cochineal, which, according to them, consists of, 1*st*, carmine, a particular animal matter; 2*d*, a fatty substance, composed of stearine, elaine, and an odorous acid; 3*d*, salts, phosphate of lime, carbonate of lime, muriate of potass, phosphate of potass, and potass united to an organic acid. The chief properties of carmine are, that it is of a purple red colour, inalterable in dry air, fusible at 122 Fahrenheit, very soluble in water, soluble in alcohol, insoluble in ether; does not yield ammonia, when decomposed; when alumine in jelly is put into a solution, it precipitates the carmine, and forms the substance which painters call red lake, or carmine.

Med. use.—Cochineal is enumerated among the diuretic remedies. It has also been recommended as an anodyne to children in hooping-cough, but I do not know that it has been proved to possess any narcotic power. Lately it has been extolled as a remedy in *Neuralgia.* Sauter prescribed 20 drops of the tincture, morning and evening. On the recurrence of a violent fit, half a table spoonful was taken at one time, and the pain ceased in a few minutes and never returned. In another case the pain ceased at once and for ever. In a third case, although the patient took half a table spoonful mitigation only was obtained. In pharmacy it is used for colouring tinctures and lip salves.

But cochineal is used chiefly in the arts for the sake of the fine colour it furnishes, and it is principally consumed by the scarlet dyers. The colour is easily extracted by alcohol, water, and water of ammonia; and in the dried insect it is not impaired by keeping for any length of time.

Off. Prep.—Tinct. cardamomi comp. *L.* Tinct. cinchonæ comp. *L. D. E.* Tinct. aristolochiæ serpentariæ, *E.* Tinct. gentianæ comp. *E.* Tinct. hellebori nigri, *E.*

COCHLEARIA.

Willd. *g.* 1128; Spr. *g.* 2299; Smith, *Flor. Brit. g.* 297. *Tetradynamia Siliculosæ.*—Nat. ord. *Siliquosæ*, Linn., *Cruciferæ*, sect. *Cochleariæ*, Juss.

Sp. 1. Willd. *et* Smith. COCHLEARIA OFFICINALIS. *Dub.*

Common scurvy-grass.

Off.—The plant [*].

THIS is an annual or biennial plant, which grows on the sea-shore of the northern countries of Europe, and is sometimes cultivated in gardens. It is used only in its recent state, and is gathered in spring when in flower. The whole plant is smooth and succulent; the radical leaves cordate, subrotund; the cauline leaves sessile, oblong, sinuato-dentate. When fresh, it has a peculiar pungent smell when bruised, and a kind of bitter acrid taste, which it loses completely by drying, but which it imparts, by distillation, to water or alcohol. It also furnishes an essential oil with sulphuretted hydrogen, the smell of which is extremely pungent.

Med. use.—The fresh plant is a gentle stimulant and diuretic, and is chiefly used for the cure of sea-scurvy. It may be eaten in substance, in any quantity, or the juice may be expressed from it, or it may be infused in wine or water, or its virtues may be extracted by distillation. The juice is recommended as a gargle in scorbutic affections of the gums and mouth.

Sp. 8. Willd.; *sp.* 4. Smith. COCHLEARIA ARMORACIA [†]. *Ed. Lond. Dub.*

Horse-radish.

Off.—The root.

COCHLEARIA ARMORACIÆ RADIX. *Ed. Dub.* ARMORACIÆ RADIX. *Lond.*

HORSE-RADISH is perennial, and sometimes found about river sides, and other moist places. For medicinal and culinary uses, it is cultivated in gardens. It flowers in June, but rarely perfects its seed in this country. The root is very long, simple, cylindrical, whitish, fleshy and succulent. It is gathered in autumn, and used only in its fresh state, when it has a pungent smell, and a penetrating acrid taste; but it also contains a sweet juice, which sometimes exudes upon the surface. Both water and alcohol extract its virtues by infusion. By drying, it loses all its acrimony, becoming first sweetish, and afterwards almost insipid: if kept in a cool place, covered with sand, it retains its pungency for a considerable time.

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[*] *Syn.* Britannica, (*Plin.*) Cranson officinal, Herbe aux cuillers, (*Fr.*) Löffelkraut, (*Ger.*) Coclearia, (*It.*)

[†] *Syn.* Ραφανὶς αγρῖα, (*Dios.*) Cranson de Bretagne, Raifort sauvage, Grand raifort, (*Fr.*) Meerretig, (*Ger.*) Rafano rusticano, Ramolaccio, (*It.*)

About 4 *per mille* of volatile oil, extremely pungent, and heavier than water, arose in distillation with water.

Med. use.—This root is an extremely penetrating stimulus. It excites the solids, and promotes the fluid secretions. It is commonly used as a condiment, and has frequently been of service in scurvy, and other chronic disorders. Sydenham recommends it likewise in dropsies, particularly those which sometimes follow intermittent fevers.

Off. Prep.—Inf. armoraciæ comp. *D. L.* Spiritus armoraciæ comp. *D. L.* Cataplasma sinapis, *D.*

Cocos BUTYRACEA. *Ed.*

Willd. *g.* 1680, *sp.* 3; Nat. ord. *Palmæ*, Linn. & Juss.; *Monœcia. Hexandria.*

The makaw tree?

Off.—The fixed oil of the nut, called Palm oil.

OLEUM FIXUM COCI BUTYRACEÆ ex nucibus. *Ed.*

UNDER this name Linnæus has given the description of the fructification of the *Pindova* of Piso, furnished to him by Mutis. This has been adopted by Willdenow, and Kunth, who gives, as other synonimes, *Palma real, Palma dolce, Palma de Cuesco, Palma de vino*, and *Corozo de los maranos.* Mutis gives as its *habitat* the neighbourhood of the mines of Ybaquensis; Kunth names New Grenada, the valley of the Magdalene, the bottom of the Andes of Quindiu, and the valley of Crusca, near Carthagena, and Piso says it forms dense woods in Brazil. It seems, therefore, widely disseminated in South America. Piso describes the nut, when ripe, as of a yellowish or brownish-green colour. The exterior covering is filamentous, as in the coco nut, but only twice the thickness of an egg shell. Under it there is a little flesh of a saffron colour, having scarcely any taste, which is eaten by the negroes, mixed with flour. Within this is an oval nut, of great hardness, which contains a kernel about the size of a walnut, white, hardish, drier, and not so sweet as that of the cocoa. They are collected at every season of the year, and eaten both by the natives and strangers. They are called by the Brazilians *Inaia-miri*, or small coco. From the kernels an excellent oil is expressed, white, and of a pleasant smell, which, when recent, is used in dressing food, and when old is burned in the lamp. A yellower oil is also got from the bark of the fruit. Linnæus adds, that the natives throw the nuts, bruised and coarsely beat, into water, that the kernels, by long maceration, and without any assistance of heat or expression, become dissolved. The butter swims upon the water, and the heavier portions fall to the bottom. By macerating it thus thrice, the whole butyraceous matter is extracted. At 20° R. it has the consistence of white butter; at 23° it is liquid like oil.

It is singular that neither Martius nor Sprengel mention *Cocos butyracea* as a species or as a synonime; but they describe a palm, very frequent over a great part of Brazil, under the name of *Attalia compta*, to which they give as a synonime the *Pindova* of Piso, and of which Martius says the fruit is agreeable to men, especially the negroes, apes, and birds, and furnishes oil. But I am not certain that it is the same with the *Cocos butyracea* Lin.

The chief source of the palm oil is, however, the *Elæis guineensis* of all modern botanists. It is monoicous, not dioicous, as stated in most systematic writers, and is hexandrous, with three pistils. It is a native of Africa, and found wild over a great extent of its western shore. In the West Indies, and in South America, it is also abundant, but always cultivated. Dr Wright, by mistake, calls it the *Cocos butyracea.* In Guinea its native name is *Maba.* In Brazil it is called *Cocco de denté.* Its drupes abound with a fat oil. According to Martius, after being exposed for some days to the sun, they are boiled in water, and expressed through linen, when they yield a large quantity of pellucid, limpid, pale yellowish, liquid, soft oil, of an agreeable smell, and used for making soap, in cooking, and for anointing the skin. The negroes are very partial to these inunctions; and when they have no oil, they rub their skins, when morbidly affected, with the drupes, raw or slightly roasted. Palm oil is highly esteemed by them as a preventive and cure for the bite of the *pulex penetrans.*

Palm oil is imported into Europe from Guinea and the West Indies. In this country it has the consistence of butter, a golden yellow colour, the smell of violets, and a sweetish taste.

When well preserved, it keeps several years without becoming rancid. When spoiled, it loses its yellow colour and pleasant smell. It is said to be often imitated with axunge, coloured with turmeric, and scented with Florentine iris root. It melts at 84° Fahr., and in this state is fluid, and passes easily through filtering paper. Alcohol at 40° dissolves it in the cold, and ether dissolves it in any proportion. It is saponified very quickly and completely by alcohol. M. Henry found it to contain 31 of stearine, and 69 of elaine. It is rarely used in medicine, and only externally as an emollient ointment. Of late it has been imported in considerable quantity, and used in the manufacture of a toilet-soap.

COLCHICUM AUTUMNALE. *Ed. Lond. Dub.*

Willd. *g.* 707, *sp.* 1.; Spr. *g.* 1358, *sp.* 2.; Smith, *Flor. Brit. g.* 187, *sp.* 1. *Hexandria Trigynia.*—Nat. ord. *Liliaceæ*, Linn., *Colchiceæ*, Juss.

Meadow saffron [*].

Off.—The root in the spring, when the leaves appear; and the seeds.

a) RADIX COLCHICI AUTUMNALIS. *Ed.* RADIX COLCHICI; radix recens. *Lond.* BULBUS. *Dub.*
b) SEMINA COLCHICI. *Lond. Dub.*

MEADOW SAFFRON is a perennial bulbous-rooted plant, which grows in wet meadows in the temperate countries of Europe. It flowers in the beginning of autumn, at which time the old bulb begins to decay, and a new bulb to be formed. In the following May the new bulb is perfected, and the old one wasted and corrugated. It is dug up for medical use in the beginning of summer, before it shoots up its flower stem. It is said that in autumn the bulbs are eaten without injury in Carniola. The Dublin College with propriety indicate the bulb as the part used in medicine. It is roundish, gibbous, a little conical, of the size of a tulip root, covered with a coriaceous tunic, brown externally, with parallel nerves or fibres; the back is marked by a deep groove; the internal parenchyme is solid, white, fleshy, succulent; when cut with a knife, particles of starch adhere to the blade. Its smell, when recent, is hircine; its taste acrid, strongly irritating the throat. It is very tenacious of life, and when attempted to be dried entire gets wasted and inert by vegetation without nutriment. Hence its activity has been said to be destroyed by drying. This, however, is denied by Mr Haden. He recommends the roots to be cut into thin slices, spread out on perforated trays, and dried at a temperature of at least 130°; and Mr Battley coincides with him. From 8 lbs. of fresh roots, Mr Bainbridge got 2 lbs. 15 oz. of dried slices, which yielded 2 lbs. 10$\frac{1}{4}$ oz. of fine powder, and 4 oz. of outside scales.

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[*] *Syn.* Εφημερον, (*Theoph.*) Κολχικον, (*Dios.*) Mort-au-chien, Tue-chien, (*Fr.*) Zeitlosc, Herbstzeitlosc, (*Ger.*) (Colchico, (*It.*)

The active properties of colchicum depend upon one of that numerous class of substances recently discovered, and which, from their possessing certain properties of alkalies, have been called alkaloids. Its existence in the root of the colchicum, and in that of white hellebore, was ascertained by Pelletier and Caventou; and it had been previously discovered in the seeds of the veratrum sabadilla by Meissner and Van Mons, and called *Veratria.* Pelletier and Caventou found in the colchicum an oil consisting of elaine and stearine, with a particular volatile acid; veratria; yellow colouring matter, gum, starch; inuline in abundance, lignine. It was also examined by Melandri and Moretti, who got besides parenchyme, starch, mucous extractive, sugar, gluten, albumen, an acrid and bitter extractive, (impure veratria?) oxygenizable extractive, resin, malic and muriatic acid and lime.

The seeds have lately been introduced into practice. The fruit is a tricoccous capsule, containing very small greyish seeds, furnished with an arillus, and almost round.

Med. use.—The poisonous property of colchicum was known to Dioscorides and Pliny. The expressed juice is used in Alsace to destroy vermin in the hair. In modern times, it was first recommended as a diuretic by Baron Stoerck; but the trials made of it at that time seemed to prove that it was a very inert substance, probably from improper pharmacy. The success of the French nostrum, called *Eau medicinale d'Husson,* in relieving the pain in paroxysms of gout, led to an attempt to discover its composition; and it is worthy of remark, that before the principle upon which their activity depends was known, the white hellebore and meadow saffron should have each respectively been suspected to be the active ingredient by Mr Moore and Mr Want. The discovery of *veratria* in both is a strong presumption that the virtue of the *Eau d'Husson* really depends upon that alkaloid, from whatever plant it be prepared. Be this as it may, since that time various preparations of colchicum have been very generally used, chiefly in gouty and rheumatic attacks, as a substitute for the *Eau medicinale.*

A saturated *Vinum colchici*, prepared by macerating two ounces of the fresh root cut in slices, in twenty-four ounces of white wine, in a gentle heat for six days, the spirit being previously carried off by heat, and filtering the solution, is now frequently used as a substitute for it in gout, chiefly on the recommendation of Sir E. Home, rheumatism, and dropsy; and there is no doubt that it produces similar, and sometimes even fatal, effects. It acts irregularly, sometimes relieving the pain without any other obvious effect; but it often combines an anodyne effect with a drastic operation as an emetic, purgative or diuretic. Dr Scudamore has ably treated of these pretended specifics in gout, and condemns them as ultimately injurious.

Mr Haden gives the powdered colchicum bulb, in all inflammatory affections, in doses of from two to eight grains, with a scruple or more of sulphate of potass, every four or six hours; increasing the dose, until either vomiting or purging is produced on the second or third day, when the medicine is either laid aside, or given in diminished doses.

The seeds have lately been also recommended by Dr Williams in the form of a vinous infusion, as being less uncertain than the wine of the recent root.

Off. Prep. of the bulb.—Vinum colchici, *L.* Acetum colchici, *L. D.* Oxymel colchici, *D.* Syrupus colchici autumnalis, *E.* *Of the seed.*—Tinctura seminum colchici, *D.*

COLOCYNTHIDIS PULPA. *Lond. Dub.* See CUCUMIS.

COLUMBO. *Dub.* See COCCULUS PALMATUS.

CONIUM MACULATUM. *Ed. Lond. Dub.*

Willd. *g.* 533, *sp.* 1; Spr. *g.* 1079, *sp.* 1; Smith, *Flor. Brit. g.* 130, *sp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ*, Linn. Juss.

Hemlock *.

Off.—The leaf, flower, and seed.

a) FOLIA CONII MACULATI. *Ed. Dub.* FOLIA CONII. *Lond.*
b) SEMINA CICUTÆ. *Lond.*

THIS is a large biennial umbelliferous plant, which grows very commonly about the sides of fields under hedges, and in moist shady places. In spring it is very poisonous, in harvest less so. The stalk is often three, four, and even six feet high, hollow, smooth, not beset with hairs, but marked with red or brown spots. The leaves are large, and have long and thick footstalks, which at the lower end assume the form of a groove, and surround the stem. From each side of the footstalk, other footstalks arise, and from these a still smaller order, on which there are sessile, dark-green, shining, lancet-shaped, notched leafits. The umbels are terminal and compound. The flowers consist of five white heart-shaped leaves. The seeds are flat on the one side, and hemispherical on the other, with five serrated ribs. This last circumstance, with the spots on the stalks, and the peculiar very nauseous smell of the plant, somewhat resembling the urine of a cat, serve to distinguish it from all other plants. We must not be misled by its officinal name, Cicuta, to confound it with the *Cicuta virosa* of Linnæus, which is one of the most virulent plants produced in this country, and readily distinguishable from the conium, by having its hollow roots always immersed in water, which those of the conium never are. The other plants which have been mistaken for the *conium maculatum* are, the *æthusa cynapium*, *caucalis anthriscus*, and several species of *chærophyllum*, especially the *bulbosum*, which, however, is not a native of this country.

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* *Syn.* Κώνειον, (*Theoph.*) La Cigue ordinaire, La grande cigue, (*Fr.*) Der Schierling, der gefleckte Schierling, (*Ger.*) Cicuta, (*It.*) Cicuta maculata, (*Lamarck.*) Conium croaticum, (*Kit.* var.)

Hemlock should not be gathered unless its peculiar smell be strong. The leaves should be collected in the month of June, when the plant is in flower. The leafits are to be picked off, and the footstalks thrown away. The leafits are then to be dried quickly in a hot sun, or rather on tin plates before a fire, and preserved in bags of strong brown paper, or powdered and kept in close vessels, excluded from the light; for the light soon dissipates their green colour, and with it the virtues of the medicine.

I do not know why the Dublin College, in their first edition, ordered the seeds to be gathered *unripe*. They are rejected from the last. The narcotic seeds are most active and uniform when perfectly ripe.

When the fresh root is wounded, it yields a bitter and acrid juice, which Störck found to excite in the tongue, swelling, stiffness, violent pain and transient paralysis. The expressed juice is green, and retains its colour when filtered through woollen cloth or coarse paper; but through dense filtering paper it becomes transparent, with a slight tint of brown, the green fecula, chlorophylle, being retained. The filtered liquor deposites albumen, and is acid. With re-agents, the most remarkable property, Pfaff observed, was that with pernitrate of mercury, the precipitate, and also the supernatant liquor, acquired a fine rose-red colour. Schrader made a comparative analysis of wild and cultivated hemlock and of green cabbage leaves, and he found the principles in all very much alike; the green fecula alone possessed the peculiar smell which distinguishes hemlock; but Pfaff does not agree with him, and asserts, that the limpid filtered juice possessed the characteristic smell in the highest degree; and he is of opinion that the virtues of the hemlock reside in a volatile principle, which, however, he was not able to procure separate. The distilled water contains a little acetic acid, and smells of hemlock, but does not contain an atom of volatile oil or hydrocyanic acid, and it did not evince any narcotic properties even on birds. Dr Paris says that "the medicinal activity of the plant resides in a resinous element, which may be obtained in an insulated form by evaporating an etherial tincture made with the leaves on the surface of water. It has a rich dark green colour, and contains the peculiar odour and taste of hemlock in perfection. A dose of half a grain will produce vertigo and headach. It may be distinguished by the name of *Conein.*" This observation is by no means sufficient to establish this green extract to be an individual principle. It is probable that the ether had dissolved some of the narcotic principle, but not pure, as the green colour certainly arose from its combination with chlorophylle, which ether dissolves from all green leaves. Nor can I agree with Pfaff that the narcotic principle is in itself very volatile. The smell of opium and the fumes of its decoction are highly narcotic, although its true narcotic principle, *morphia,* is fixed; and some of the narcotic bases, as atropia and solanea, cannot be prepared without danger, and yet, when pure, are fixed. Brandes, whose essay I have not seen, found in hemlock a particular principle, which he called *Cicutine,* a very odorous oil, albumen, resin, colouring matter and salts. He considers cicutine to be an alkaline resinoid, of a deep green colour, insoluble in water, causing vertigo, and intense headach in the dose of half a grain; its smell was very remarkably virose, and its taste disagreeable and nauseous. Hemlock juice soon ferments, and sometimes evolves nitrous gas. This was first mentioned to me by Mr Barry, and I find that the same singular phenomenon has been observed in the juices of beet, borage, and woad. Pfaff says that nitre is frequently found crystallized in the extract of hemlock.

Med. use.—The whole plant is a virulent poison, but varying very much in strength, according to circumstances.

When taken in an over-dose, it produces vertigo, dimness of sight, difficulty of speech, nausea, fetid eructations, anxiety, tremors, and paralysis of the limbs. But Dr Stoerck found, that in small doses it may be taken with great safety; and that, without at all disordering the constitution, or even producing any sensible operation, it sometimes proves a powerful remedy in many obstinate disorders. In scirrhus, the internal and external use of hemlock has been found useful, but mercury has been generally used at the same time. In open cancer it often abates the pain, and is free from the constipating effects of opium. It is likewise used in scrofulous tumours and ulcers, and in other ill-conditioned ulcers. It is also recommended by some in chincough, and various other diseases.

Its most common and best form is that of the powdered leaves, in the dose at first of two or three grains in the course of a day, which in some cases has been gradually increased to upwards of two ounces daily; but the powder must have been badly prepared, as I have found it sufficiently active to require caution in its exhibition. An extract from the seeds is said to produce giddiness sooner than that from the leaves.

Off. Prep.—Tinct. conii, *D.* Succus spissatus conii, *D. E.* Extractum conii, *L.* Unguentum conii, *D.* Cataplasma conii, *D.*

CONTRAYERVÆ RADIX. *Lond.* See DORSTENIA.

CONVOLVULUS.

Willd. *g.* 323; Spr. *g.* 643; *Pentandria Monogynia.*—Nat. ord. *Campanaceæ*, Linn., *Convolvulaceæ*, Juss.

Spr. *sp.* 216. CONVOLVULUS SCAMMONIA. *Ed. Lond. Dub.*

Scammony *.

Off.—The gum-resin.

GUMMI-RESINA CONVOLVULI SCAMMONIÆ. *Ed. Dub.* SCAMMONEÆ GUMMI-RESINA. *Lond.*

THE scammony convolvulus is a climbing perennial plant, which grows in Syria, Mysia, and Cappadocia. The roots, which are very long and thick, when fresh, contain a milky juice. This is obtained by removing the earth from the upper part of the roots, and cutting off the tops obliquely. The milky juice which flows out is collected in a small vessel sunk in the earth at the lower end of the cut. Each root furnishes only a few drachms, but the produce of several roots is added together, and dried in the sun. This is the true and unadulterated scammony. It is light, of a dark grey colour, but becomes of a whitish yellow when touched with the wet finger, is shining in its fracture, has a peculiar nauseous smell, and bitter acrid taste, and forms with water a greenish milky fluid, without any remarkable sediment. In this state of purity it seldom reaches us, but is commonly mixed with the expressed juice of the root, and even of the stalks and leaves, and often with flour, sand, or earth. The best to be met with in the shops comes from Aleppo, in light spongy masses, having a heavy disagreeable smell, of a shining ash colour verging to black, friable, and easily powdered, powder of a light grey or whitish colour. An inferior sort is brought from Smyrna in more compact ponderous pieces, with less smell, not so friable, of a darker colour, not so resinous, and full of sand and other impurities. This is said to be the produce of the *Periploca scammonium*, and of the *Cynanchum monspeliacum.*

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* *Syn.* Scammonée d'Alep *or* de Syrie, (*Fr.*) Scammonium von Aleppo, (*Ger.*) Scamonea, (*Ital.*)

Resin is the principal constituent of scammony. Sixteen ounces of good Aleppo scammony give eleven ounces of resin, and three and a half of watery extract. Bouillon La Grange and Vogel obtained from 100 parts 60 of resin, 3 of gum, 2 of extract, and 35 of insoluble matter.

Med. use.—Scammony is an efficacious and powerful purgative. It may be given triturated with sugar, or with almonds, and becomes sufficiently safe and mild in its operation. It may likewise be conveniently suspended by trituration, in a strong decoction of liquorice, and the mixture then poured off from the fæces. The common dose of scammony is from three to twelve grains.

Off. Prep.—Extract. colocynthidis comp. *D.* Pulvis scammonii comp. *L. D. E.* Pilulæ colocynth. comp. *D.* Electuarium scammonii, *D.* Confectio scammoneæ, *L.*

Spr. *sp.* 56. CONVOLVULUS JALAPA. *Ed. Lond. Dub.*
Jalap.

Off.—The root.

RADIX CONVOLVULI JALAPÆ. *Ed.* JALAPÆ RADIX. *Lond. Dub.*

JALAP is another climbing perennial species of convolvulus. It is an inhabitant of Mexico and Vera Cruz, from which it was first imported in 1610. When recent, the root is white and lactescent; but it is brought to us in thin transverse slices, which are covered with a blackish wrinkled bark, and are of a dark grey colour internally, marked with darker or blackish stripes. It has a nauseous smell and taste; and when swallowed it affects the throat with a sense of heat, and occasions a plentiful discharge of saliva. When powdered it has a yellowish grey colour.

Such pieces should be chosen as are most compact, hard, weighty, dark-coloured, and abound most with dark circular striæ and shining points; the light, whitish, friable, worm-eaten pieces must be rejected.

Slices of bryony root are said to be sometimes mixed with those of jalap; but these may be easily distinguished by their whiter colour, and less compact texture.

Cadet de Gassicourt found in 1000 parts 100 of resin, 440 of gummy extract, 25 amylum, 25 albumen, 290 woody fibre, with phosphates, muriates and carbonates of lime, potass, magnesia, &c.

Cadet found that jalap-resin was not, as commonly believed, perfectly insoluble in ether. By means of this menstruum he analyzed it into two substances; seven parts of hard resin insoluble in ether, and three of soft resin soluble in ether. The latter, on evaporation of the ether, remained as a soft, dark brown, somewhat diaphanous, greasy substance, very difficultly dried, and gave out on being heated an acrid, suffocating, bituminous smell, which was not the case with the hard resin. Planche observed that the resin extracted from the wood was nearly white, and surpassed in activity that got from the bark, which contained also a peculiar brown colouring matter. Göbel found jalap-resin to contain more oxygen than any other resin. Its elements were, carbon, 36.62; hydrogen, 9.47; and oxygen, 53.91 = 100.

Mr Hume junior has indicated in jalap a white pulverulent substance under the name of *Jalapine*. It is obtained by treating jalap by acetic acid. After having filtered the acid solution, it is precipitated by ammonia, and the jalapine is obtained by filtration.

Resin of jalap is much employed on the Continent, and a formula for its preparation is introduced into most of the pharmacopœias. In that of Berlin for 1827, we are directed to take any quantity of jalap root, coarsely bruised, and to pour upon it rectified spirit of wine, to cover it an inch; to digest for 48 hours; to pour off the tincture; to digest a second time with fresh spirit; to mix the tinctures, and having added about a fourth part of water, to draw off the spirit by distillation; to wash the resin which subsides with warm water until it come off colourless; to dry the washed resin in a water bath, and form it into rolls. It should be of a brown-black colour, very dry, and insoluble in water and in cold ether. It is to be carefully kept.

M. Martius, by the aid of animal charcoal, deprived of colour the resin of jalap dissolved in alcohol. This resin thus purified was soluble in rectified oil of turpentine, acetic acid, ether, and in the fixed alkalies; ammonia dissolved it slightly at a boiling heat.

Med. use.—Jalap in substance, taken in a dose of about fifteen grains, proves an effectual, and in general a safe, purgative, performing the office mildly, except in hot bilious temperaments, when it gripes, but rarely takes due effect as a purge. An extract originally made by water purges almost universally, but weakly; and at the same time has a considerable effect by urine: what remains after this process gripes severely. The part of the jalap remaining after the separation of the resin, yields to water an extract, which has no effect as a cathartic, but operates powerfully by urine. The resin of jalap in the dose of four, six, or eight grains, purges in a very sensible manner; it is generally combined with sugar or emulsions, not to develop or augment its purgative property, but that it may not affect too sensibly the tissues which compose the gastro-intestinal surface with which it comes in contact.

Off. Prep.—Tinctura jalapæ, *L. D. E.* Extractum jalapæ, *L. E. D.* Pulvis jalapæ comp. *D. E.* Tinct. sennæ comp. *E.*

COPAIFERA OFFICINALIS. *Ed. Lond. Dub.*

Willd. *g.* 880, *sp.* 1; Spr. *g.* 1677, *sp.* 1. C. Jacquini. *Decandria Monogynia.*—Nat. ord. *Leguminosæ,* sect. *Papilionaceæ,* Juss.

Copaiva tree *.

Off.—The resin called Balsam of copaiba.

RESINA COPAIFERÆ OFFICINALIS; resina liquida. *Ed. Dub.*
COPAIBA; resina liquida. *Lond.*

THE tree which produces this resinous juice is a native of the Spanish West-India Islands, and of some parts of South America. It grows to a large size, and the resinous juice flows in considerable quantities from incisions made in the trunk.

Hayne has given a very full account of the species of *Co-*

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* *Syn.* Baume de Copahu, (*Fr.*) Kopaiv-balsam, (*Ger.*) Balsamo de Copaiba, (*It.*)

paifera yielding the resin. The first notice of copaiba balsam and the tree which yields it was given by Marcgrav and Piso in 1648. Jacquin observed another species in Martinique in 1763, which he called *officinalis ;* but as the denomination is no longer suitable, it has been named after its discoverer. Desfontaines in 1821 made known two other species, *C. Guaianensis* and *Langsdorffi.* Martius in 1823 described the *C. coriacea.* Lastly, Hayne has added various other species from the examination of specimens brought by Sellow from Brasil, and one communicated by Beyrich,—*C. Beyrichii, C. Martii, C. bijuga, C. nitida, C. laxa, C. cordifolia, C. Sellowii, C. oblongifolia.* Hayne is of opinion that the *C. bijuga* is the species observed by Piso and Marcgrav, and that the resin is now collected from all the species which are known to the natives of the province where they grow; but the greatest quantity is furnished by the *C. multijuga,* in the province of Para. The smaller species which grow in the interior of Brasil, as in Bahia and Minas, yield less juice, but it is more resinous and sharper. As, according to the best accounts, copaiba is brought into the market from most, if not all the species, it may be easily conceived, according to this accurate author, that this resin, without being adulterated, may present great varieties in colour, consistence, smell, and taste.

In commerce two kinds are usually distinguished, and named from the country in which they are produced, the Brasilian and West Indian. The Brasilian was formerly thought to be obtained only from Guaiana and the Island Maranhon. It is thin, clear, of a pale colour, pleasant aromatic smell, and of an acrid, bitter taste; while that procured from the Antilles is thick, golden yellow, not transparent, and of a less agreeable smell, even like turpentine. It is probably the product of the *C. Jacquinii,* the only species which grows in Martinique and Trinidad.

Its other properties are a sp. gr. of 950 to 966, total solubility in absolute alcohol, sulphuric ether, acetic ether, and in the volatile and fixed oils. It is variously acted upon by the concentrated mineral acids, and undergoes a doubtful saponification with caustic ley.

The most detailed analysis of copaiba is by Stolze. He found in 100 parts 38 volatile oil, got by distillation with water, 7.59 remaining in the distilled water, 1.66 of a clammy resin, 52 of a yellow brittle resin, 0.75 of the same resin, with traces of extractive, and some loss. M. Stolze thinks these are *educts,* not *products,* as by a gentle heat they can be reunited into a fluid having all the properties of the original copaiba.

It is often adulterated with castor oil. Sulphuric acid appears to be the best reagent for the discovery of this fraud. On mixing three parts of balsam of copaiba, and one part of sulphuric acid, they form a plastic and reddish mass; but castor oil with sulphuric acid only becomes of the consistence of turpentine, and is not coloured. Also when copaiba balsam is mixed with carbonate of magnesia, the latter is entirely dissolved, and the mixture becomes transparent if the balsam is pure; on the contrary, it becomes more opaque the more the balsam is adulterated.

Med. use.—Copaiba acts in moderate doses as a laxative, and in larger doses it often occasions copious and fluid discharges of fæcal matter without uneasiness. It also increases the flow of urine, and imparts to it a green colour, a turbid appearance, and a peculiar smell, but, as long ago pointed out by Fuller, not resembling that of violets, given to it by other turpentines. In excessive doses, Dr Armstrong says, it produces a sort of vibratory feeling in the brain, or causes a febrile anxiety, with a mental disturbance bordering on intoxication.

It has been longest and most generally used in chronic discharges from the mucous membrane of the urinary and uterine organs; and more recently it has been much praised in similar affections of the trachea and bronchiæ. It has been employed as a diuretic in dropsy, and prescribed in nephritic affections, and in painful hæmorrhoids with constipation. In dysentery and painful tenesmus its use is also indicated. Lastly, its employment has been lately extended to recent gonorrhœa. Externally, like the other resinous juices, it has been used as a vulnerary both in recent wounds and to foul ulcers, and it has been rubbed on indolent tumors and in rheumatic pains. In gleet, Jacquin recommends its injection unmixed.

The dose of copaiba rarely exceeds 20 or 30 drops, though some authors direct 60, or upwards. It may be conveniently taken in the form of an *oleosaccharum*, or in that of an emulsion, into which it may be reduced, by triturating it with almonds, with a thick mucilage of gum arabic, or with the yolk of eggs, till they are well incorporated, and then gradually adding a proper quantity of water.

CORIANDRUM SATIVUM. *Dub. Lond. Ed.*

Willd. *g.* 552, *sp.* 1; Spr. *g.* 1053, *sp.* 7; Smith, *Flor. Brit. g.* 142, *sp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ*, Linn. Juss.

Coriander.

Off.—The seeds.

SEMINA CORIANDRI SATIVI. *Ed. Dub.* CORIANDRI SEMINA. *Lond.*

CORIANDER * is an annual umbelliferous plant, a native of the south of Europe, found wild about Ipswich, and in some parts of Essex, though Dr Smith does not consider it as indigenous. It differs from all other plants of its order in producing *spherical* seeds. Their smell, when fresh, is strong and disagreeable, but by drying becomes sufficiently grateful.

Med. use.—They are recommended as carminative and stomachic, but are chiefly used as a corrective addition to senna and other active purgatives.

Off. Prep.—Aqua calcis comp. *D.* Inf. sennæ cum tamarindis, *D. E.* Tinct. sennæ comp. *E.* Confectio sennæ, *L. E.*

CORNUA. *Lond.* CORNUA CERVINA. *Dub.* See CERVUS.

CRETA. *Lond. Dub.* See CALCIS CARBONAS.

CROCUS SATIVUS. *Ed. Dub.* (ANGLICUS). *Lond.*

Willd. *g.* 92. *sp.* 1; Spr. *g.* 146, *sp.* 9; Smith, *Flor. Brit. g.* 16, *sp.* 1. *Triandria Monogynia.*—Nat. ord. *Liliaceæ*, Linn., *Irideæ*, Juss.

Saffron crocus †.

Off.—The summits of the pistils, called Saffron.

STIGMATA CROCI. *Lond.* STIGMATA CROCI SATIVI. *Ed. Dub.*

THE bulbous plant which yields saffron grows spontaneously on Mount Caucasus, the lower part of Mount Olympus, and in the mountains and valleys between Old Crimea and Jambol. Linnæus makes it indigenous in Switzerland, but he confounded the officinal variety with that which flowers in spring. The officinal variety has much larger flowers than the vernal crocus; its stigma is plumper and stronger scented. The Crimean saffron is smaller and less bitter. It is now found wild in England, but certainly not truly a native. It is very generally cultivated as an ornament to our gardens, and in some places for the saffron.

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* *Syn.* Coriandre, (*Fr.*) Coriander-samen, (*Ger.*) Coriandro, (*It.*) Cóttamillie, (*Tam. Tel.*) Mety, (*Malay.*) Cotumbāroo, (*Cyng.*) Dunya, (*Hind. Beng.*) Dhunian, (*Duk.*) Dhānyākă, (*Sans.*) Kezereh, (*Arab.*) Kishneez, (*Pers.*) Dhāna, (*Guz.*) Cottmbiri, (*Can.*)

† *Syn.* Κροκος, (*Gr.*) Safran, (*Fr.*) Safran, (*Ger.*) Zafferano, (*It.*) Koongoomapoo, (*Tam.*) Zafran, (*Arab. Duk.*) Keysar, (*Hind.*) Koonkoomapoohoo, (*Tel.*) Abeen, (*Pers.*) Safaron, (*Malay.*) Khohoon, (*Cyng.*) Kāsmirajanma, Kunkuma, (*Sans.*)

An inclosure in which saffron is cultivated is called, in France, a *saffranière.* The first year an acre yields at most one pound of dry saffron; but the second and third years it yields as much as five. Saffron appears at the end of October, when the air is moderately hot, with mild showers. The saffron flowers appear in abundance, and mantle the fields with a flax-grey covering. Each flower has one pistil, the summit of which is deeply divided into three slips, which are of a dark orange-red colour, verging to white at the base, smooth and shining. Their smell is pleasant and aromatic, but narcotic; their taste a fine aromatic bitter, and they immediately give a deep yellow colour to the saliva when chewed. The flowers are gathered early in the morning, just before they open; the summits of the pistils are picked out, very carefully dried by the heat of a stove, and sometimes compressed into firm cakes. Five pounds of fresh saffron are required to yield one pound of dry. The excellence of the saffron depends upon the manner in which it is dried. The English saffron is superior to what is imported from other countries, and may be distinguished by its blades being broader. On the Continent, they reckon the Austrian and the French from Gatinois the best. The Spanish is rendered useless by being dipt in oil with the intention of preserving it. The finest saffron, hay saffron, consists of the pistils merely dried and not squeezed into a mass. Cake saffron should be chosen fresh, not above a year old, in close cakes, neither dry, nor yet very moist; tough and firm in tearing; difficultly pulverizable; of a fiery orange-red colour, within as well as without; of a strong, acrid, diffusive smell; and capable of colouring a very large proportion of water or alcohol. Saffron which does not colour the fingers when rubbed between them, or stains them with oil, has little smell or taste, or a musty or foreign flavour, is too tender, and has a whitish, yellow, or blackish colour, is bad.

On account of the great volatility of the aromatic part of the saffron, it should be wrapped up in bladder, and preserved in a box or tin-case.

By distillation with water, saffron furnishes a small proportion of essential oil, of a golden yellow colour, heavier than water, and possessing the characteristic smell in an eminent degree. According to Hermbstædt, the soluble matter of saffron is extractive nearly pure. But Bouillon La Grange and Vogel have described it as a distinct principle, under the name of Polychroite.

Polychroite is got in scales of a reddish-yellow; bitter pungent taste like saffron; sweet smell like honey; deliquescent; soluble in water and alcohol; solutions lose their colour by exposure to light, and by chlorine; sulphuric acid changes its colour to blue, and then to lilac; nitric acid to grass green. M. Henry, head of the Central Pharmacy, has recently published some observations on the colouring matter of saffron. The polychroite, according to his researches, is a combination of this colouring matter and of volatile oil. The colouring matter exists in saffron in the proportion of 42 *per cent.* and the volatile oil in that of 10 *per cent.* According to the same professor it is to the volatile oil, rather than to the colouring matter, that the medicinal properties of saffron ought to be attributed. 32 grammes of saffron, perfectly dry, afforded 3 grammes of oil.

Med. use.—Saffron is aromatic, and slightly bitter, and its odour is penetrating, and apt to excite headach. Its action upon the nervous system is undeniable; it has also been alleged that it raises the spirits, and in large doses occasions immoderate mirth, involuntary laughter, and the other effects which follow from the abuse of spiritous liquors. It was supposed to be particularly serviceable in hysteric depressions, or obstructions of the uterine secretion, but has been laid aside in consequence of some trials, which, I suspect, were not conclusive. It is now little used except as a colouring substance.

Off. Prep.—Syrupus croci, *L.* Tinctura croci, *E.* Tinct. aloes comp. *L. E.* Tinct. cinchon. comp. *L. D.* Tinct. rhœi, *L.* Tinct. rhœi comp. *L. D.* Decoctum aloes comp. *D.* Confectio aromatica, *L. D.* Pilulæ aloes cum myrrha, *L. D.* Pilulæ e styrace, *D.*

CROTON.

Willd. *g.* 1713; Spr. *g.* 3135, *Monœcia Monadelphia.*—Nat. ord. *Tricoccæ*, Linn., *Euphorbiaceæ*, Juss.

Eleutheria, or Cascarilla *.

Willd. Spr. *sp.* 2. CROTON CASCARILLA. *Dub. Lond.* Willd. *sp.* 47. Spr. 84. CROTON ELEUTHERIA. Swartz. Prodrom. *Ed.*

Off.—The bark.

CORTEX CROTONIS ELEUTHERIÆ. *Ed.* CORTEX. *Lond. Dub.*

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* *Syn.* Kina spuria aromatica, (*Off.*) Cascarille, (*Fr.*) Kaskarille, Graue Fieberrinde, (*Ger.*) Cascariglio, (*It.*)

The bark, which has been occasionally called *Elutheria*, is identical with *cascarilla*. Europe is supplied with it exclusively from the Bahama Islands, although the shrub or tree is found also in Jamaica. It is the *Clutia eluteria* of Linnæus, the *Croton eluteria* of Swartz and subsequent authors. This is called by Browne sea-side balsam; is larger than the congenerous species, and grows frequently, according to him, to the height of four or five feet. By Dr Wright it is said to rise to about twenty feet. The plant named by the London and Dublin Colleges is the *Croton cascarilla* of Willdenow, *Croton humile* of Linnæus and Lunan, small sea-side balsam of Browne, who describes it as very hot and pungent upon the palate; and Descourtilz says that the negro doctors of Port de Paix, where it forms entire thickets, consider it as a panacea. He describes it as having an acrid bitter taste, and a very agreeable aromatic smell. The *Croton lineare* of Lunan and Jacquin, the *Clutia cascarilla* of Linnæus, the wild rosemary of Jamaica, is made by Sprengel a distinct species, but by Willdenow only a variety of his *Cr. cascarilla.* Of the wild rosemary, however, Dr Wright says that the bark has none of the sensible qualities of the cascarilla of the shops.

This bark is in general imported either in curled pieces, or rolled up into short quills, from two to four inches long, about one inch broad, and a line or more in thickness, covered with a rusty brownish epidermis, often beset with lichens, rugose, with transverse lines; substance brownish, equal, resinous and shining; with a weak aromatic balsamic smell, becoming strong on being rubbed, and when burnt pleasant like that of musk, and an unpleasant, bitter, hot aromatic taste.

Trommsdorff got from 8 ounces, 720 grains of mucilage and bitter principle; 580 of resin; 68 of volatile oil; 2520 of fibrous matter; and 48 of water. Its virtues are partially extracted by water, and totally by alcohol; but it is most effectual when given in substance.

Med. use.—It produces a sense of heat, and excites the action of the stomach; and it is therefore a good and pleasant stomachic, and may be employed with advantage in flatulent colics, internal hæmorrhagies, dysenteries, diarrhœas, and similar disorders.

As the essential oil is dissipated in making the extract, this preparation acts as a simple bitter.

Off. Prep.—Tinctura cascarillæ, *D. L.* Infusum cascarillæ, *D. L.*

Sp. 40. Spr. 52. Croton tiglium. *Lond.* De Candolle. *Dub.*

The oil expressed from the seeds *.

Tiglii oleum. *Lond.* Oleum ex seminibus expressum. *Dub.*

This species is a native of India, and from its seeds is expressed the croton oil, admitted into the materia medica of the London and Dublin Pharmacopœias. The seeds themselves, in use among the natives of the East from time immemorial, were formerly well known in Europe as a drastic purgative, under the name of *Grana Molucca*, or *Grana Tilii*, but they had fallen into oblivion, when the attention of the profession was again called to them by the observations in Dr Ainslie's Materia Medica of Hindoostan. The seed very much resembles in form the castor oil seed. The fruit is smooth, about the size of a hazel nut, and consists of three monospermous coques. The seeds themselves are less than half an inch long, subquadrangular, commonly covered with a yellowish epidermis marked with brown, or of an uniform dark colour, and they are not glossy like the castor oil seed. When one of the seeds is abortive, the two fertile seeds are glued together, like coffee berries, and marked with a deep furrow by the central axis of the fruit. The proportions of the husks to the kernel is about 36 to 64. They have been analyzed by several chemists. Dr Nimmo got 60 of oily matter, and 40 of residuum, which, from the analysis of Pelletier and Caventou, consisted, as in other oily seeds, chiefly of albumen. According to Mr Pope their acrimony resides in the episperm, and especially in the fine membrane covering the cotyledons, which, however, is not very probable.

The purgative virtue resides in a fixed oil, which can be separated by expression, in the way in which castor oil is obtained. The oil seems to have been first prepared and used in medicine by the Dutch surgeons about a century ago; and Rumphius distinctly states that a single drop taken in Canary wine was a common purgative. A quantity of it was brought to Europe in 1820 by Mr Conwell, by whose recommendation it soon got into general use, and its qualities are such that it is likely to keep its place.

The oil, which is sold in very small bottles, is of a yellow colour, has a faint smell, and excites a very durable sense of heat and pricking in the throat. Dr Nimmo of Glasgow has found this oil to consist of 45 *per cent.* of an acrid purgative principle soluble in alcohol, sulphuric ether, and volatile and fixed oils, and slightly reddening turnsole, and of 55 *per cent.* of an oil insoluble in alcohol, soluble in oil of turpentine and in sulphuric ether, bland, and like oil of olives. From the high price at which croton oil is sold, it is frequently adulterated with the cheaper fixed oils. In my own practice I have certainly found it of late less powerful and milder than when first introduced. Dr Nimmo has suggested that the adulteration may be detected by the action of alcohol, which will dissolve a less proportion if mixed with olive oil, and a larger if mixed with castor oil; but it is evident this test will fail if it be adulterated with a mixture of olive and castor oils.

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* *Syn.* Granum Moluccanum, Grana Tiglia, Tilli grana, (*Off.*) Cadel avanacu, (*Rheede:*) Petit Pignon d'Inde, Graines des Moluques, Grains de Tilly, (*Fr.*) Purgierkörner, (*Ger.*) Grani de Tiglio, (*It.*) Nérvalum cottay, (*Tam.*) Jumal gota, (*Hind. Duk.*) Dund, (*Pers.*) Batoo, (*Arab.*) Naypalum vittiloo, (*Tel.*) Jaya pala, (*Can.*) Nepala, (*Sans.*) Bori, (*Malay.*) Nepalam, (*Cyng.*) Cheraken, (*Java.*)

Med. use.—The seeds are so active, that half a seed, or a grain weight, is a drastic purge; and many methods of mitigating its severity have been recommended by the native practitioners, such as removing the perisperm, picking out the embryo, and roasting or boiling the seeds. The cotyledons boiled soft were pounded into a mass, and made up with twice their weight of catechu, and divided into pills, containing half a grain of croton each, of which two were the dose for an adult. " In a very short time," says Mr Marshall, " after taking the pills, perhaps in half an hour, the patient is sensible of a rumbling motion in his bowels, which, after another half hour, is followed by a stool: this rumbling continues during the whole of the operation: the stools are invariably watery and copious. In about one case in ten, the medicine produces griping; in about one in thirty, nausea."

Croton oil is a very certain and powerful drastic purgative; and from the smallness of its dose, it can be given in circumstances where other effectual medicines cannot be swallowed. Thus, in coma, a drop or two let fall upon the tongue will operate; and to lunatics and other obstinate patients a sufficient dose can be easily administered with the food. To others it may be given made up into a pill with bread crumb, or a drop may be given on a lump of sugar: but where there is no reluctance to oil, one drop of croton oil with half an ounce of castor oil is a most effectual purge.

CUBEBA. *Lond. Dub.* See PIPER.

CUCUMIS COLOCYNTHIS. *Ed. Dub. Lond.*

Willd. *g.* 1741, *sp.* 1; Spr. *g.* 2364, *sp.* 19; *Monœcia Syngenesia.*—Nat. ord. *Cucurbitaceæ*, Linn. Juss.

Coloquintida, or bitter apple *.

Off.—The medullary part of the fruit.

PULPA CUCUMERIS COLOCYNTHIDIS, ex fructu. *Ed.* PULPA COLOCYNTHIDIS, peponum pulpa. *Lond.* COLOCYNTHIS; fructus pulpa. *Dub.*

THIS is an annual plant, a native of Turkey.

Burckhardt, in his travels across Nubia, found the country covered with colocynth. The fruit is gathered in autumn, when it begins to turn yellow, and is then peeled and dried quickly, either in a stove or in the sun. It is about the size of an orange, globular, smooth, yellow, with six divisions filled with seeds like those of a melon, surrounded by a dry spongy pulp. As brought to us peeled they are whitish, covered with the remains of the peel, very light, dry and spongy like pith, with a weak and disagreeable smell, and an intensely bitter nauseous taste. The seeds constitute three-fourths of their whole weight, and are directed to be removed for the better preservation of the pulp.

Neumann got from 7680 parts 1680 alcoholic extract, and then 2160 watery; and inversely, 3600 watery, and 224 alcoholic.

Its constituents are stated by Dr Edwards to be a resin insoluble in ether; a peculiar bitter principle called by Vauquelin *Colocinthine*, a fixed oil, extractive, gum and various salts.

Colocinthine is the principle to which its nauseous bitterness and active properties belong. It is a resinoid substance, yellow, friable, more soluble in alcohol than in water. Its watery infusion has a fine golden yellow colour, and jellies on cooling, (Braconnot says colocynth contains the pectic acid). With infusion of nutgalls it gives an abundant white precipitate.

The seeds are in themselves bland and nutritious, and constitute an important article of food in northern Africa.

Med. use.—Colocynth is a drastic purgative capable even of exciting inflammation of the intestines. The simple extract is rarely used on account of the small quantity obtained; but the compound extract is one of the most powerful and useful of our cathartics.

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* *Syn.* *Σικύς πικρὰ, Κολοκύνθη ἀλεξανδρίνη*, (*Diosc.*) Colquinte, (*Fr.*) Coloquintt, (*Ger.*) Coloquintida, (*It.*) Peycōomutikāi, Varriecoōmutiè kāi, (*Tam.*) Indrawun kaphal, (*Duk.*) Machal, (*Beng.*) Portsa hāia, (*Tel.*) Indrӑ vedruni, Vishala, (*San.*) Indrāin, (*Hind.*) Hunzil, (*Pers. Arab.*) Totta commodoo, (*Cyng.*) Dahorth, (*Egypt.*)

Off. Prep.—Extract. colocynthidis, *L. D.* Extr. colocynth. comp. *L. E. D.* Pilulæ colocynthidis comp. *E. D.*

CUMINUM CYMINUM. *Lond.*

Willd. *g.* 547; Spr. *g.* 1077, *sp.* 1; *Pentandria Monogynia.* —Nat. ord. *Umbellatæ,* Linn. Juss.

Cummin *.

Off.—The seeds.

SEMINA CUMINI. *Lond.*

THE cummin is an annual umbelliferous plant, in appearance resembling fennel, but much smaller. It is a native of Egypt; but the seeds are brought chiefly from Sicily and Malta. They are of an ash grey colour, about two lines long, oval, linear, flat on one side, convex and striated on the other. They have a strong unpleasant smell, and a bitter, acrid, aromatic taste. They contain a yellowish volatile oil, lighter than water, in which the smell and taste reside.

Med. use.—They are carminative, and in some countries are used as a condiment, and, as a seasoning, added to bread and to cheese.

CUPRUM. *Lond. Ed.*

Copper †.

COPPER is found in many countries. 1. In its metallic state, crystallized; native copper: or sulphuretted alone, or with other metals. 2. Oxidized; uncombined, red copper ore: or combined with carbonic, sulphuric, arsenic, muriatic, phosphoric, or silicic acids.

Copper is bright red; disagreeable taste and smell when rubbed or heated; specific gravity, 7.79; ductile; of great tenacity; sonorous; fusible at 27° Wedgwood; granulated texture, and subject to blisters; a good conductor of caloric, electricity, and galvanism; becomes brown, and at last green in the air; when heated turns blue, yellow, violet, deep brown; when ignited and plunged into water, forms brown, brittle scales of oxide. Its phosphuret is brilliant, brittle, hard, and fusible; its sulphuret brown, fusible, and very phosphoric; its alloy with arsenic is white, with bismuth reddish, with antimony violet, with mercury deep red, with zinc forms brass, and with tin is orange: it is oxidized and dissolved by the sulphuric, nitric, and muriatic acids; its oxide is brown, brittle, and soluble in ammonia, acquiring a beautiful blue colour.

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* *Syn.* Κύμινον, (*Gr.*) Cumin, (*Fr.*) Mutterkümmel, Römischen Kümmel, (*Ger.*) Comino, (*It.*) Sîrágum, (*Tam.*) Dooroo, (*Cyng.*) Jeera, (*Beng.*) Zira, (*Duk. Hind.*) Kemun, (*Arab.*) Zéréh, (*Pers.*) Jintan, (*Malay.*) Gilakara, (*Tel.*) Jīraka, Ajāji, (*Sans.*) Jeerága, (*Can.*)

† *Syn.* Venus, (*Off.*) Cuivre, (*Fr.*) Kupfer, (*Ger.*) Rame, (*It.*) Shemboo, (*Tam.*) Tāmbā, (*Hind. Duk.*) Tāmbran, (*Tel.*) Tāmra, Tāmraka, (*Sans.*) Tambaga, (*Malay.*) Mis, (*Pers.*) Nóhass, (*Arab.*) Tung, (*Chin.*)

Copper has more smell and taste than almost any other metal. Its effects, when taken into the stomach, are highly deleterious, and often fatal. It particularly affects the primæ viæ, exciting excessive nausea, vomiting, colic pains, and purging, sometimes of blood, or, though more rarely, obstinate constipation. It also produces agitation of the mind, and headach; renders the pulse small and weak, the countenance pale, and causes fainting, convulsions, paralysis, and apoplexy. When any of these symptoms occur, we must endeavour to obviate the action of the poison by large and copious draughts of oily and mucilaginous liquors, or to destroy its virulence by solutions of potass, or sulphuret of potass; but according to Orfila, there is no remedy at all comparable to sugar, a discovery which we owe to Marcelin Duval, and therefore, as soon as we know that a person has been poisoned by copper, he should be made to swallow sugar and syrup in large quantities.

Poisoning from copper is most commonly the effect of ignorance, accident, or carelessness; and too many examples are met with of fatal consequences ensuing from eating food which had been dressed in copper vessels not well cleaned from the rust which they had contracted by being exposed to the action of air and moisture; or pickles, to which a beautiful green colour had been given, according to the homicidal directions of the most popular cookery books, by boiling them with halfpence, or allowing them to stand in a brass pan until a sufficient quantity of verdigris be formed.

Great care ought to be taken that acid liquors, or even water, designed for internal use, be not suffered to stand long in vessels made of copper, otherwise they will dissolve so much of the metal as will give them dangerous properties. But the sure preventive of these accidents is, to banish copper utensils from the kitchen and laboratory. The presence of copper in any suspected liquor is easily detected by inserting into it a piece of polished steel, which will soon be coated with copper, or by dropping into it some carbonate of ammonia, which will produce a beautiful blue colour if any copper be present.

But although copper be thus dangerous, some preparations of it are in certain cases used with great advantage, both externally and internally.

The chief of these are, 1. The sub-acetate of copper, *verdigris;* 2. The acetate; 3. The sulphate of copper, *blue vitriol;* 4. The sub-sulphate of copper and ammonia; 5. The muriate of copper and ammonia; 6. A solution of the sulphate of copper and super-sulphate of alumina in sulphuric acid.

CUPRI SUB-ACETAS. *Dub.* V. S. ÆRUGO. *Ed.* ÆRUGO, S. S. Sub-acetas cupri impura. *Lond.* ÆRUGO. *Dub.*

Sub-acetate of copper. Verdigris *.

THE preparation of this substance was almost confined to Montpellier in France, owing chiefly to a regulation which existed, that no verdigris could be sold until it had been examined and found of sufficiently good quality. Since that regulation has been abolished, the Montpellier verdigris has lost its decided superiority of character. It is prepared by stratifying copper-plates with the husks and stalks of the grape, which have been made to ferment after the juice has been expressed from them. In from ten to twenty days, when the husks become white, the plates of copper are taken out, and their surfaces are found to be covered with detached and silky crystals. They are now placed on edge, with their surfaces in contact, in the corner of a cellar, and alternately dipt in water, and replaced to dry every seven or eight days, for six or eight times. By this management the plates swell, and are every where covered with a coat of verdigris, which is easily separated with a knife. In this state it is only a paste, and is sold by the manufacturers to merchants who beat it well with wooden mallets, and pack it up in bags of white leather, a foot high, and ten inches wide, in which it is dried by exposing it to the air and sun until the loaf of verdigris cannot be pierced with the point of a knife.

Sub-acetate of copper should be of a bluish green colour, dry and difficult to break, and should neither deliquesce, have a salt taste, contain any black or white spots, nor be adulterated with earth or gypsum. Its purity may be tried by diluted sulphuric acid, in which the sub-acetate dissolves entirely, and the impurities remain behind.

Verdigris, as it comes to us, is generally mingled with stalks of the grape; they may be separated, in pulverization, by discontinuing the operation, as soon as what remains seems to be almost entirely composed of them.

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* *Syn.* Vert-de-gris, (*Fr.*) Grünspan, (*Ger.*) Verderame, (*It.*)

Verdigris is also prepared, both in England and in Scotland. Copper forms several combinations with acetic acid, which have been carefully analyzed by Mr Phillips and Berzelius. Verdigris consists of one proportional of acetic acid, 50; one of per-oxide of copper, 80; and six of water, 54 = 184. When verdigris is triturated with water, it is decomposed; it is partly dissolved in the state of a trisacetate, and partly forms an insoluble diacetate.

Med. use.—Verdigris is seldom or never used internally; applied externally, it proves a gentle detergent and escharotic, and is employed to destroy callous edges, or fungous flesh in wounds. It is also advantageously applied to scorbutic ulcers of the mouth, tongue, or fauces, and deserves to be carefully tried in cancerous sores.

Off. Prep.—Oxymel cupri subacetatis, *D.*

CUPRI ACETAS; crystalli. *Dub.*

Acetate of copper; distilled verdigris [*].

THIS salt is prepared by dissolving in distilled vinegar, or rather pyrolignic acid, freshly prepared verdigris. The solution is allowed to deposite, is decanted, and then duly evaporated. The mode in which it is crystallized is peculiar. Sticks split at one end into four, with the portions kept apart by little pins of wood, are suspended in the liquid, upon which the salt crystallizes in truncated quadrangular pyramids. When these are observed not to increase any further, the solution is concentrated, and the sticks are immersed in them a second time, when well-formed crystals form on the surface of the groups previously obtained. These crystals are rhomboidal, of a very deep green colour; they effloresce gently in the air, and become of a light bluish green, and they ought to be entirely soluble in water. They consist of one proportional of peroxide of copper, 80; two of acetic acid, 100; and three of water, 27 = 207; according to which view it is a binacetate.

In pharmacy these crystals are sometimes used for yielding acetic acid, *radical vinegar.*

SULPHAS CUPRI. *Ed. Dub.* SULPHAS CUPRI. *Lond.*

Sulphate of copper. Blue vitriol [†].

THIS metallic salt is rarely formed by combining directly its component parts; but it is obtained, either by evaporating mineral waters which contain it, or by acidifying native sulphuretted copper, by exposure to the action of air and moisture, or by burning its sulphur.

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[*] *Syn.* Verdet, (*Fr.*) Destillirten Grünspan, Kupferkrystallen, (*Ger.*)

[†] *Syn.* Vitriol bleu, Vitriol de Chypre, Couperose bleue, (*Fr.*) Zyprischer Vitriol, Kupfervitriol, blauer Galitzenstem, Blaustein, (*Ger.*) Vetriolo de Cipro, Vetriolo de rame, Vetriolo turchino, (*It.*)

When pure it has a deep blue colour, and is crystallized generally in long rhomboids. It effloresces slightly in the air, is soluble in four parts of water at 60°, and in two at 212°, and is insoluble in alcohol. By heat it loses, first its water of crystallization, and afterwards all its acid. It is decomposed by the alkalies and earths, and some of the metals, the alkaline carbonates, borates, and phosphates, and some metallic salts.

Blue vitriol consists of two atoms of sulphuric acid, 80; one of peroxide of copper, 80; and ten atoms of water, 90 = 250. It is therefore strictly a bisulphate, and not a sulphate.

Med. use.—The sulphate of copper has a strong styptic, metallic taste, and is chiefly used externally as an escharotic for destroying warts, callous edges, and fungous excrescences, as a stimulant application to ill-conditioned ulcers, and as a styptic to bleeding surfaces. Taken internally, it operates, in very small doses, as a speedy emetic. It has, however, been exhibited in incipient phthisis pulmonalis, intermittent fever, and epilepsy; but its use is not free from danger.

CURCUMA LONGA. *Dub.*

Willd. *g.* 11. *sp.* 2; Spr. *g.* 10. *sp.* 12. *Monandria Monogynia.*—Nat. ord. *Scitamineæ*, Linn., *Drymirrhizæ Japica.*

Turmeric *.

Off.—The root.

TURMERIC is much cultivated in all parts of India, for the sake of its root. The ground must be rich, friable, and so high as not to be overflowed during the rainy season. It is often planted on land, where sugar canes grew the preceding year. The soil must be well plowed and cleared of weeds. It is then raised into ridges with intervening trenches. The cuttings or sets, viz. small portions of the fresh root, are planted in May, on the tops of the ridges, at 18 or 24 inches asunder. An acre requires about 900 sets, and yields in December about 2000 lbs. of the fresh root.

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* *Syn.* Κυπειρος ἴνδικος, (*Diosc.*) Terra merita, saffran des Indes, (*Fr.*) Gelbwurzel, (*Ger.*) Curcuma, (*It.*) Munjil, (*Tam.*) Timmur, (*Egypt. Arab.*) Huldie, (*Duk.*) Zirsood, (*Arab.*) Zirdchoobeh, (*Pers.*) Huldie, (*Hindoo.*) Kurkum, (*Hebrew.*) Arsina, (*Caes.*) Passopoo, Pampi, (*Tel.*) Mangellacua, (*Hort. Mal.*) Haradul, (*Guz.*) Haridrā, (*Sans.*) Hulud, (*Mah.*) Keang whang, (*Chin.*)

The bulbs are small, with numerous, long, palmate tubers, which are inwardly of a deep yellow colour. As brought to Europe after being dried, they are cylindrical or oblong, about the size of a pigeon's egg, tuberculated, rugose, heavy, tough, externally yellowish brown, internally of a deep yellow, marked with shining points, with a smell like cerate, and a bitterish, somewhat acrid taste, tinging the saliva deeply. They have been analyzed by Pelletier and Caventou, and contain lignine, amylum, a peculiar yellow colouring principle, brown colouring principle of the same nature as that found in many extracts, gum, an odorous and very acrid volatile oil, and a small quantity of muriate of lime. The yellow colouring matter of a reddish brown colour in mass, is yellow when in a state of division, heavier than water, of an acrid peppery taste, deliquescent in moist air, sparingly soluble in water, very soluble in alcohol, ether and the oils. Alkalies change it speedily to red brown, and hence it is an excellent test of their presence.

Med. use.—It is considered by the Hindoos as a condiment and stomachic, and is an essential ingredient of their curries, a dish much eaten in every part of India, and which is now almost naturalized among the higher classes of this country. It is also employed in obstructions of the abdominal viscera, in jaundice, and in chronic watery diarrhœa.

CUSPARIÆ CORTEX. *Lond.* See BONPLANDIA.

CYDONIÆ SEMINA. *Lond.* See PYRUS.

DAPHNE MEZEREUM. *Ed. Lond. Dub.*

Willd. *g.* 733; Spr. *g.* 1477, *sp.* 1; Smith, *Flor. Brit. g.* 194, *sp.* 1. *Octandria Monogynia.* — Nat. ord. *Vepreculæ*, Linn., *Thymeleæ*, Juss.

Mezereon, spurge olive *.

Off.—The bark of the root.

DAPHNES MEZEREI CORTEX. Ex radice. *Ed.* CORTEX. *Dub.* MEZEREI CORTEX. Radicis cortex. *Lond.*

MEZEREON is indigenous. It is also cultivated in our gardens as a flowering shrub. The bark, which is taken from the trunk, larger branches, and root, is in slips of greater or less breadth, sometimes flat, sometimes convoluted, very tough, thin, striated and fibrous; epidermis smooth, olive coloured, or greyish brown; bark very thin, soft, of a dark green, liber yellowish white, fibrous, tough. Smell when recent, nauseous, little when dry; taste at first sweetish, afterwards very hot and corroding the mouth. It is torn off in the spring before the leaves appear. When applied to the skin in its recent state, or infused in vinegar, it raises blisters. It has been most minutely analyzed by Gmelin, who found wax, resin, daphneine, red colouring matter, uncrystallizable and fermentable sugar, azotiferous gum, lignine, brown colouring matter, malic acid and malates. Daphneine was discovered by Vauquelin in the *Daphne alpina.* It crystallizes in fasciculated prisms, colourless, transparent, brilliant, very soluble in water, alcohol and ether, assuming a golden colour with a little potass or its carbonate, precipitable by acetate of lead, and converted into oxalic acid by nitric acid. It evaporates, on being heated, in acrid vapours.

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* *Syn.* Μεζαέρεον, (*Gr. Mod.*) Laureole gentile, Garon, (*Fr.*) Kellerhals, gemeiner Seidelbast, (*Ger.*) Mezereo, Biondella, (*It.*)

The apothecaries use the entire root, and not the bark alone, of which the wood is yellow and hard, and has the same properties as the bark.

Med. use.—The root was long used in the Lisbon diet-drink, for venereal complaints, particularly nodes, and other symptoms resisting the use of mercury. The bark of the root contains most acrimony, though some prefer the woody part. Mezereon has also been used with good effect in tumours and cutaneous eruptions not venereal.

Dr Cullen says that it acts upon the urine, and upon the perspiration; and that in irritable habits it quickens the pulse, and increases the heat of the whole body. But Mr Pearson of the Lock Hospital asserts, that excepting a case or two of lepra, in which a decoction of this plant conferred temporary benefit, he very seldom found it possessed of medical virtues, either in syphilis, or in the sequelæ of that disease. In scrofula or in cutaneous affections it is employed chiefly under the form of decoction.

The berries are still more acrid than the bark, and they have even been known to produce fatal effects on children, who have been tempted by their beauty to eat them. It is said that they are sometimes infused in vinegar, to make it more pungent and appear stronger.

Off. Prep.—Decoctum mezerei, *D. E.* Decoct. sarsaparillæ comp. *L. E. D.*

DATURA STRAMONIUM. *Ed. Dub. Lond.*

Willd. *g.* 377, *sp.* 1; Spr. *g.* 670, *sp.* 6; Smith, *Flor. Brit. g.* 98, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ,* Linn. Juss.

Thorn-apple. James-town weed [*].

Off.—The plant and seeds.

a) DATURÆ STRAMONII HERBA. *Ed.* HERBA. *Dub.* STRAMONII FOLIA. *Lond.*

b) STRAMONII SEMINA. *Lond. Dub.*

THE thorn-apple is an annual plant, indigenous in the north of America, but now grows wild on dry hills and uncultivated places in England. The herb grows from one to two feet high. The stem is straight, cylindrical, smooth, a little shining, simple below, dichotomous at top, with diverging branches, very slightly pubescent, leaves about the size of a hand, alternate, a little succulent, oval, pointed, unequally sinuated and toothed, of a dark green, shining and marked with veins, having short footstalks, cylindrical, a little canaliculated at the upper part, flowers axillary at the division of the branches; fruit an ovoid capsule, covered with very sharp prickles, consisting of four incomplete cells, communicating two and two, and opening equally by four valves.

Every part of the plant, when bruised, has a disagreeable smell and nauseous taste. The thorn-apple is a strong narcotic poison, producing vertigo, torpor, death. Dr Barton mentions the cases of two British soldiers, who ate it, by mistake, for the Chenopodium album: one became furious, and ran about like a madman, and the other died, with the symptoms of genuine tetanus. The best antidote to its effects is said to be vinegar. The leaves have been analyzed by Promnitz. He got gummy extractive, 58; extractive, 6; fœcula, 64; albumen, 15; resin, 12, and salts, 23=100.

The seeds are small, kidney shaped, brownish, and rough on the surface. They contain the narcotic principle in a more uniform degree than the other parts, and hence are more to be depended upon for internal use. They are said to be added to fermented liquors, to render them more stupifying for criminal purposes. An excellent analysis of the thorn-apple seeds has been published by M. Brandes in Buchner's Repertorium for 1821, and in which it is shewn that its peculiar properties depend upon a peculiar alkaloid, *Daturia.*

Daturia crystallizes in acicular prisms. It is more soluble in hot than in cold alcohol. It forms crystallizable salts with sulphuric, muriatic and nitric acids, and a deliquescent mass with acetic. It also combines with iodine. M. Brandes was always affected with headach and dyspnœa after tasting the salts of daturia, and therefore concludes that it is the narcotic principle of the seeds of the thorn-apple.

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[*] *Syn.* Τάτουλα, (*Mod. Gr.*) Stramoine, Pomme epineuse, (*Fr.*) Gemeine Stechapfel, (*Ger.*) Stramonio, Pomo spinoso, (*It.*)

Med. use.—Dr Stoerck first tried the herb as a remedy in mania and melancholy, with considerable success. It has also been employed, and sometimes with advantage, in convulsive and epileptic affections. Dr Barton of Philadelphia gives it in powder, beginning with doses of a few grains, and increasing them, in some days, to 15 or 20. In a case, in which it was exhibited to the extent of 30 grains, it dilated the pupil of one eye, and produced temporary paralysis of the eyelids. Hufeland gave it in the form of a tincture, prepared with two ounces of the seeds in four ounces of wine, and one of diluted alcohol, in diseases of the mind. The inspissated juice of the leaves has been most commonly used; but its exhibition requires the greatest caution. At first, a quarter of a grain is a sufficient dose. Externally, an ointment prepared from the leaves has been said to give ease in external inflammations and hæmorrhoids. And the bruised leaves, according to Plenk, soften hard and inflamed tumours, and discuss tumours in the breasts of nurses, from indurated milk.

The smoke of the stramonium has been much extolled for the cure of asthma. Its use in this manner has been derived from the East Indies, where, however, other species of *datura*, the *fatuosa* and *ferox*, are employed. It is the root and lower part of the stem which are used. These are to be dried as quickly as possible, cut into slips, and beat so as to divide the fibres. The manner of using them is by filling the bowl of a tobacco-pipe, as with tobacco, and inhaling the smoke. Stramonium smoke excites a sense of heat in the chest, followed by copious expectoration, and sometimes attended with temporary vertigo or drowsiness, and rarely nausea. It frequently gives relief when a pipe is thus smoked upon a paroxysm being threatened, or even after its commencement; the patient falls asleep, and awakes recovered from the paroxysm. In some cases a perfect cure is effected, but more commonly the relief is only temporary. I have found it very valuable as a palliative. The direct application of the remedy to the seat of the disease is at least rational.

The late Dr Marcet of London has published a very valuable paper on the use of stramonium, in Medic. Chirurg. Trans. vol. vii. p. 551. He used it in the form of extract; and the result of his experience is, that its most common effect, when administered in doses of 1-8th to one grain, in cases of chronic disease, attended with acute pain, is to lessen powerfully, and almost immediately, sensibility and pain; to occasion a sort of nervous shock, which is frequently attended with a momentary affection of the head and eyes, with a degree of nausea, and with phenomena resembling those that are produced by intoxication; to excite in many instances nervous sensations, which are referred to the œsophagus, bronchia, or fauces, and which sometimes amount to a sense of suffocation; to have rather a relaxing than an astringent effect upon the bowels; to have no marked influence upon the frequency of the pulse, though in a few instances it has appeared to render it somewhat slower; to produce but a transitory and inconsiderable dilatation of the iris and pupil; and to have but little immediate tendency to induce sleep, except from the state of comparative serenity and ease which generally follows the symptoms just described.

Off. Prep.—Extractum stramonii, *D.*

DAUCUS CAROTA. *Ed. Lond. Dub.*

Willd. *g.* 530; Spr. *g.* 1064, *sp.* 1; Smith, *g.* 128, *sp.* 1. *Pentandria Digynia.*—Nat. ord. *Umbellatæ*, Linn. Juss.

Carrot *.

Off.—The seeds of the wild, and root of the garden carrot.

a) DAUCI SYLVESTRIS SEMINA. *Dub.* DAUCI (AGRESTIS) SEMINA. *Lond.*

b) DAUCI (HORTENSIS) RADIX. *Lond.* DAUCI CAROTÆ RADIX. *Ed. Dub.*

THIS is a biennial indigenous plant, which is cultivated in great quantities as an article of food. The seeds, which should be collected from the wild variety, are flat on one side, convex on the other, slightly ciliated and marked with five ribs, have a moderately pungent bitter taste, and an agreeable aromatic smell. They are carminative, and are said to be diuretic. They contain a great deal of volatile oil.

The wild variety has small woody roots, unfit for medicinal use. Those of the cultivated varieties are fusiform, about a foot in length, of a yellow colour varying into orange and white, transversely wrinkled, with scattered radicles, consisting of a reticulated bark, a fleshy parenchyme, and a round or angularly radiated medulla. They contain much mucilaginous and saccharine matter, and are therefore highly nutritious and emollient. When boiled and beaten to a pulp, they form an excellent application to carcinomatous and ill-conditioned ulcers, allaying the pain, checking the suppuration and fetid smell, and softening the callous edges.

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* *Syn.* Σταφυλινος, (*Diosc.*) Σταφυλύνα, (*Mod. Gr.*) Carote, (*Fr.*) Gemeine Mohrrübe, (*Ger.*) Carota, (*It.*)

Off. Prep.—Cataplasma dauci, *D.*

DELPHINIUM STAPHISAGRIA. *Lond. Dub. Ed.*

Willd. *g.* 1061, *sp.* 13; Spr. *g.* 1985, *sp.* 24. *Polyandria Trigynia.*—Nat. ord. *Multisiliquæ,* Linn., *Ranunculaceæ,* sect. *Helleboreæ,* Juss.

Stavesacre *.

Off.—The seed.

SEMINA STAPHISAGRIÆ. *Lond. Dub.* DELPHINII STAPHISAGRIÆ SEMINA. *Ed.*

STAVESACRE is a biennial plant, a native of the south of Europe. The seeds are usually brought from Italy. They are large and rough, have an irregular triangular figure, and are blackish on the outside, and yellowish or whitish within; they have a disagreeable smell, and a very nauseous, bitterish burning taste.

A new alkaloid, called Delphinia, was discovered nearly at the same time by Lasseigne and Feneulle in France, and by Brandes in Germany. It is obtained in the usual manner, either by boiling the decoction with pure magnesia, separating the fluid by filtration, and boiling the residuum with alcohol, which lets fall as it cools the alkaloid in white flocculi; or by acting upon the bruised seeds by dilute sulphuric acid, and adding subcarbonate of potass, which precipitates the alkaloid. Delphinia is soluble in alcohol and ether, sparingly so in water, saturates acids, and is precipitated by alkalies. Its taste is bitter and acrid. Its salts rarely form regular crystals, but a hard transparent mass. It contains no azote. In the seeds it is said to exist united with malic acid; and along with two bitter principles, one brown, and another yellow; oil, volatile and fixed; albumen, azotiferous matter, mucus, saccharine mucus, and mineral salts.

Med. use.—Stavesacre was employed by the ancients as a cathartic; but it operates with so much violence, both upwards and downwards, that its internal use has been for some time almost laid aside. It is chiefly employed in external applications for some kinds of cutaneous eruptions, and for destroying lice and other insects; insomuch, that from this virtue it has received its name in different languages.

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* *Syn.* Σταφις αγρια, (*Diosc.*) 'Αγριο σταφιδα, (*Zacynth.*) Staphisaigre, herbe aux poux, (*Fr.*) Stephanskraut, Lauskörner, (*Ger.*) Stafisagria, (*It.*)

DIANTHUS CARYOPHILLUS. *Ed. Dub.*

Willd. *g.* 893, *sp.* 9; Spr. *g.* 1697, *sp.* 23; Smith, *g.* 204, *sp.* 3. *Decandria Digynia.*—Nat. ord. *Caryophylleæ,* Linn. Juss.

Clove Gillyflower. Clove pink, or carnation.

Off.—The flowers[*].

FLORES DIANTHI CARYOPHYLLI. *Ed.* FLORES. *Dub.*

THIS species of dianthus is perennial, and is a native of Italy, though now found wild on the walls of old castles in England. By cultivation, its varieties have increased to a very great number, and they form one of the greatest ornaments of our flower gardens. Most of these are termed Carnations; but the variety which is officinal surpasses all the others in the depth of its colour, and the richness of its smell. Their only use in pharmacy is to give a pleasant flavour and beautiful colour to an officinal syrup.

Off. Prep.—Syrupus dianthi caryophylli, *E.*

DIGITALIS PURPUREA. *Ed. Lond. Dub.*

Willd. *g.* 1155; Spr. *g.* 2163, *sp.* 1. *Didynamia Angiospermia.*—Nat. ord. *Solanaceæ,* Linn., *Scrophulariæ,* Juss.

Foxglove[†].

Off.—The leaves and seeds.

a) DIGITALIS PURPUREÆ FOLIA. *Ed.* DIGITALIS FOLIA. *Lond. Dub.*

b) DIGITALIS SEMINA. *Lond.*

THIS is an indigenous biennial plant, very common on hedge-banks, and sides of hills, in dry, gravelly, or sandy soils, and the beauty of its appearance has gained it a place in our gardens and shrubberies. The leaves are large, oblong, egg-shaped, soft, covered with hairs, and serrated. They have a bitter, very nauseous taste, with some acrimony. We should choose the leaves of plants which grow spontaneously in elevated places exposed to the sun, and gather them before their inflorescence. Destouches analyzed foxglove. Four ounces of the dried leaves yielded successively 9 drachms of watery, and 78 grains of alcoholic extract. The first was brown, smooth, and of a consistence fit for making pills. The second had a very deep green colour, a virose and disagreeable smell, the consistence of tallow, but more tenacious; did not furnish ammonia by distillation, and was not acted upon by acids. The ashes contained salts of lime and potass. M. Le Royer thinks that he has discovered the active principle of digitalis, Digitaline. He describes it as brown, pitchy, deliquescent, capable of crystallization, but not crystallized, of intense bitterness, and seeming to possess the properties of the plant in a high degree. It has not, however, been admitted as an ascertained principle by other chemists.

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[*] *Syn.* Κωρυοφύλλου, (*Lacon.*) Flores tunicæ, (*Off.*) Œillet, (*Fr.*) Nägelchen Gartennelken, (*Ger.*) Garofano hortense, (*It.*)

[†] *Syn.* Digitale pourpre, Doigtier, (*Fr.*) Rother Fingerhut, (*Ger.*) Digitale porporino, Guantelli, Aralda, (*It.*)

The seeds are very small, and contained in an ovoid capsule.

Med. use.—The effects of foxglove, when taken into the stomach, are, to diminish the frequency of the pulse; to diminish the irritability of the system; to increase the action of the absorbents, and to increase the discharge by urine.

In excessive doses, it produces vomiting, purging, dimness of sight, vertigo, delirium, hiccough, convulsions, collapse, death. For these symptoms, the best remedies are cordials and stimulants. According to the doctrine of the new Italian school, it is one of the most powerful contro-stimulants.

Internally, digitalis has been recommended, in inflammatory diseases, from its very remarkable power of diminishing the velocity of the circulation; in active hæmorrhagies; in phthisis; in some spasmodic affections, as in spasmodic asthma, palpitation, &c.; in mania from effusion on the brain; in anasarcous and dropsical effusions; in scrofulous tumours; and in aneurism of the aorta, and hypertrophy of the heart, I have seen it alleviate the most distressing symptoms.

Externally, it has been applied to scrofulous tumours. It may be exhibited, 1. In substance, either by itself, or conjoined with some aromatic, or made into pills, with soap or gum ammoniac. Withering directs the leaves to be gathered after the flowering stem has shot up, and about the time when the blossoms are coming forth. He rejects the leaf-stalk, and middle rib of the leaves, and dries the remaining part, either in the sunshine, or before the fire. In this state, they are easily reduced to a beautiful green powder, of which we may give, at first, one grain twice a-day, and gradually increase the dose, until it act upon the kidneys, stomach, pulse, or bowels, when its use must be laid aside, or suspended.

2. In infusion. The same author directs a drachm of the dried leaves to be infused for four hours in eight ounces of boiling water, and an ounce of any spiritous water to be added to the strained liquor, for its preservation. Half an

ounce, or an ounce of this infusion, may be given twice a-day.

3. In decoction. Darwin directs that four ounces of the fresh leaves be boiled in two pounds of water, until they be reduced to one, and that half an ounce of the strained decoction be taken every two hours, for four or more doses.

4. In tincture. Put one ounce of the dried leaves, coarsely powdered, into four ounces of diluted alcohol; let the mixture stand by the fire-side twenty-four hours, frequently shaking the bottle; and the saturated tincture, as Darwin calls it, must then be separated from the residuum, by straining or decantation. Twenty drops of this tincture were directed to be taken twice or thrice a-day, but the dose is dangerous. The Edinburgh College use eight ounces of diluted alcohol to one of the powder, but let it digest seven days.

5. The expressed juice and extract are not proper forms of exhibiting this very active remedy.

When the digitalis is disposed to excite looseness, opium may be advantageously conjoined with it; and when the bowels are tardy, jalap may be given at the same time, without interfering with its diuretic effects. During its operation in this way, the patient should drink very freely. Two cases of phthisis are related by Dr Gregg, in which it produced a copious ptyalism.

Off. Prep.—Infusum digitalis, *D. L. E.* Tinctura digitalis, *D. L. E.*

DIOSMA CRENATA. *Dub.*

Spr. *g.* 863, *sp.* 33, *Serratifolia*, Crot.? *Pentandria Monogynia.*—Nat. ord. *Rutaceæ*, sect. *Diosmeæ.*

Off.—The leaves. Buchu.

FOLIA. *Dub.*

THIS is a very low shrub, which, with other species of the same genus, occupies a very limited belt at the Cape of Good Hope. The leaves are coriaceous, elliptical, lanceolate, slightly acute, or shorter and obtuse, especially those on the younger twigs. Their margin is very finely serrated and glandular. Their upper surface is smooth, of a clear shining green, the inferior paler and beset with scattered glandular points, translucent when held between the eye and the light. They have a very strong scent, somewhat resembling mint, to which they have also a similarity in taste, without heat, bitterness, or evident astringency.

They have been analyzed by Cadet de Gassicourt, who got volatile oil, 6.65; gum, 211.7; extractive, 51.7; chlorophylle, 14; resin, 21.51=302.56. The volatile oil was light, of a brownish yellow colour, and had an intense and peculiar odour. The extractive precipitated very sensibly the infusion of gallnuts; no astringency was detected by gelatine, but a green colour was given to the persalt of iron.

Med. use.—The Buchu leaves are used as a popular indigenous remedy by the Hottentots at the Cape in a variety of disorders. They infuse it in vinegar, which becomes almost as thick as a mucilage, and apply it to wounds. A watery infusion of half an ounce to the pound, is a remedy for gravel and morbid irritation of the bladder and urethra, cystirrhœa, and disease of the prostate, and likewise in chronic rheumatism. A tincture is also used as a stimulating embrocation. These good effects have been confirmed by Dr Macdowall, and other practitioners in this country.

Off. Prep.—Tinctura Buchu, *D.* Infusum Buchu, *D.*

DOLICHOS PRURIENS. *Ed. Lond. Dub.*

Willd. *g.* 1349, *sp.* 16. STIZOLOBIUM PRURIENS; Spr. *g.* 2564, *sp.* 2. *Diadelphia Decandria.*—Nat. ord. *Papilionaceæ*, Linn., *Leguminosæ*, sect. *Papilionaceæ*, Juss.

Cow-itch. Cowhage [*].

Off.—The stiff hairs which cover the pods.

PUBES DOLICHI PRURIENTIS, ex legumine. *Ed.* PUBES DOLICHI. LEGUMINUM PUBES. *Lond.* PUBES LEGUMINIS. *Dub.*

THE dolichos, *Macuna pruriens* of De Candolle is a climbing plant, growing in great abundance in warm climates. The pods are about four inches long, round, and as thick as a man's finger. On the outside they are thickly beset with stiff brown hairs, which, when applied to the skin, occasion a most intolerable itching. In the choice of cow-itch, we must reject all those pods which are shrivelled, brown, and diminutive in size, have lain long in damp warehouses, and are musty, or of a bad colour.

Med. use.—The ripe pods are dipped in syrup, which is again scraped off with a knife. When the syrup is rendered by the hairs as thick as honey, it is fit for use. It acts mechanically as an anthelmintic, occasions no uneasiness in the primæ viæ, and may be safely taken, from a tea-spoonful to a table-spoonful in the morning, fasting. The worms are said to appear with the second or third dose; and by means of a purge, in some cases the stools have consisted entirely of worms. For further information, the publications of Mr Chamberlayne may be consulted.

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[*] *Syn.* Stizolobium, (*Off.*) Pois à gratter, (*Fr.*) Kuhkrätze, (*Ger.*) Poonaykālie, (*Tam.*) Peeliadugookāila, (*Tel.*) Kiwach, (*Hind.*) Kaunchkoorikebinge, (*Duk.*) Atmagŭpta, Kapikachliu, (*Sans.*) Rawe, (*Jav.*) Kosambiliwail Dewigpaghura, (*Cyng.*)

DORSTENIA CONTRAJERVA. *Ed. Lond.*

Willd. *g.* 244, *sp.* 5. *Tetrandria Monogynia.* Spr. *g.* 3074, *sp.* 8. *Monœcia Androgynia.* — Nat. ord. *Scabridæ,* Linn., *Urticeæ,* Juss.

Contrayerva.

Off.—The root.

RADIX DORSTENIÆ CONTRAJERVÆ. *Ed.* RADIX CONTRAJERVÆ. *Lond.*

THIS plant is perennial, and grows in South America, and some of the Caribæan islands.

The root is knotty, an inch or two long, and about half an inch thick, of a reddish brown colour externally, and pale within; long, rough, slender fibres shoot out from all sides of it, and are generally loaded with small brown knots. It has a peculiar kind of aromatic smell, and a somewhat astringent, warm, bitterish taste, with a light and sweetish kind of acrimony, when long chewed: the fibres have little taste or smell; the tuberous part, therefore, should be alone chosen.

This root contains so much mucilage, that a decoction of it will not pass through the filter. Neumann got from 480 parts, 190 watery extract, and afterwards 7 alcoholic, and inversely, 102 alcoholic, and 60 watery. I find that the tincture reddens infusion of litmus, is precipitated by water, and has no effect on the salts of iron.

Med. use.—Contrayerva is a gentle stimulant and a diaphoretic, and is sometimes given in exanthematous diseases, typhus, and dysentery. Its dose is about half a drachm.

DRYMIS AROMATICA. De Candolle. *Dub.* See WINTERA.

DRYABALANOPS CAMPHORA. Colebrooke. *Dub.*

Polyandria Monogynia ?—Nat. ord. *Guttiferæ,* Juss.

THIS tree is quoted by the Dublin College, as one of the sources of officinal camphor. Dr Ainslie also says, that it is the most common variety in the bazaars of India. But both are mistaken. Marsden states the extravagant price given by the Chinese for the Borneo camphor, while they export the Japan as of no estimation. Also Mr Crawford, the historian of the Indian Archipelago, as well as Mr

Colebrooke, notice its rarity, and the great request it is in for the Chinese market, so that it is sold in China for seventy-eight times the price of common camphor. In fact, it is brought to India and Europe in small quantities only as specimens.

The camphire tree of Sumatra, according to Marsden, is a native of the northern parts of the island only, growing without cultivation, in the woods which lie near to the sea coast, and is equal in height and bulk to the largest timber trees, being frequently found upwards of fifteen feet in circumference. The leaf is small, of a roundish oval, ending in a long point or tail, the fibres running all parallel and nearly straight. The wood is in much esteem for carpenter's purposes, being easy to work, light, durable, and not liable to be injured by insects. The flower has not yet been seen by any botanist, but the fruit has been accurately described by Mr Colebrooke, who has from it determined the natural family to which the tree belongs. The camphire, *Capoor Barroos*, does not exude from the tree, or manifest any appearance on the outside. The natives, by long experience know whether any is contained within, by striking it with a stick. In that case they cut the tree down and split it with wedges into small pieces, finding the camphor in the interstices in the state of a concrete crystallization. Some have asserted that it is from the old trees alone that this substance is procured, and that in the young trees it is in a fluid state, called *meenia capoor*, or camphor oil; but this Mr Marsden pronounces to be a mistake. The same kind of tree that produces the fluid does not produce the dry, transparent, and flaky substance, nor ever would. They are readily distinguished by the natives. Many of the trees, however, produce neither the one nor the other. The traders distinguish usually three different degrees of quality in it, by the names of head, belly and foot, according to its purity and whiteness, which depend upon its being more or less free from particles of wood, and other heterogeneous matters that mix with it in collecting, after the first large pieces are picked out.

To procure the camphire oil, they make a transverse incision into the species of tree yielding it, to the depth of some inches, and then cut sloping downwards from above the notch, till they leave a flat horizontal superficies. This they hollow out, till it is of a capacity to receive about a quart. They then put into the hollow a bit of lighted reed, and let it remain for about ten minutes, which acting as a stimulus, draws the fluid to that part. In the space of a night, the liquor fills the receptacle prepared for it, and the tree continues to yield a less quantity, for three successive nights, when fire must be again applied; but on a few repetitions it is exhausted.

Med. use.—Mr Marsden says, "I know not what superiority in the materia medica is allowed to the *capoor barroos* in point of efficacy. It is possibly considerable, though certainly not in the proportion of fifty to one. Perhaps it may not have had a fair trial, being rarely brought to Europe but as a curiosity."

"The camphor oil is a valuable domestic remedy, and much used by the Sumatrans, in strains, swellings and inflammations; the particles, from their extreme subtilty, readily entering the pores." To me it appears equivalent to oil of turpentine.

DULCAMARA. *Dub.* See SOLANUM.

ELATERIUM. *Lond. Dub.* See MOMORDICA.

ELEMI. *Lond. Dub.* See AMYRIS.

ERYTHRÆA CENTAURIUM. Persoon. *Dub.* See CHIRONIA.

EUGENIA CARYOPHYLLATA. *Dub. Lond. Ed.*

Willd. *g.* 972, *sp.* 24. *Icosandria Monogynia.*—Nat. ord. *Hesperideæ*, Linn., *Myrtineæ*, Juss.

The clove tree [*].

Off.—The flower-bud and its essential oil.

a) FLORES EUGENIÆ CARYOPHYLLATÆ. Flores nondum expliciti. *Ed. Dub.* CARYOPHYLLI. Flores nondum expliciti, siccati. *Lond.*

b) OLEUM VOLATILE EUGENIÆ CARYOPHYLLATÆ. Ex floribus nondum explicitis. *Ed.* OLEUM CARYOPHYLLORUM. Eorum oleum essentiale. *Lond.* OLEUM VOLATILE. *Dub.*

THIS is a beautiful tall tree, a native of the Molucca islands. Every part of it is highly aromatic, especially the leaf stalk. Cloves are the flower-buds, which are gathered in October and November, before they open, and when they

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[†] *Syn.* Girofle, Clous de girofle, (*Fr.*) Gewurznelken, (*Ger.*) Kruidnagelon, (*Dutch.*) Garofano, (*It.*) Crāumboo, (*Tam.*) Lāong, (*Duk. Hind.*) Warrala, (*Cyng.*) Lăvăngă, (*Sans.*) Chankée, Buah lawang, (*Mal.*) Lawanghm, (*Tel.*) Kerenful, (*Arab.*) Mykhek, (*Pers.*) Thenghio, (*Chin.*) Wohkayu lawang, (*Jav.*) Bu-wah-lawang, (*Bali.*)

are still green, and are dried in the sun, after having been exposed to smoke for some days.

Cloves, *Caryophylli aromatici*, have somewhat the form of a nail, the germen resembling the body, and the calyx the head. Their colour should be of a deep pitch brown, internally reddish; their smell strong, peculiar, and grateful; their taste acrid, aromatic, and permanent. The best cloves are also large, heavy, brittle, but not crumbly, and when pressed with the nail, exude a little oil. When light, soft, wrinkled, dirty, pale, and without smell or taste, they are to be rejected, having probably been steeped in water before being dried.

Cloves yield by distillation with water about one-seventh of their weight of volatile oil; 960 parts also gave to Neumann 380 of a nauseous, somewhat astringent, watery extract. The same quantity gave 300 of excessively fiery alcoholic extract. When the alcoholic extract is freed from the volatile oil by distillation with water, the oil that arises proves mild, and the resin that remains insipid. Its pungency therefore seems to depend on the combination of these principles.

Trommsdorff got from cloves, of volatile oil, 18; extractive and astringent matter, 17; gum, 13; resin, 6; fibre, 28; and water, 18=100. M. Lodibert extracted, by means of alcohol, from Molucca cloves, called English, a fixed green and aromatic oil, and a crystalline matter. *Caryophylline* is a white, brilliant, and satiny substance, in fasciculated and diverging crystals, without taste or smell, soluble in boiling alcohol and ether. M. Bonastre considers it as a subresin; 500 grammes of Molucca cloves yielded 15 grammes of this substance. Cloves grown in Barbadoes contain much of it, and cloves from Cayenne none at all.

The volatile oil, when recently distilled, is very fluid, heavier than water, clear, transparent, and colourless, although it gradually becomes amber coloured and brown; entirely soluble in alcohol, acquiring a deep red by the action of nitric acid, and then becoming changed into oxalic acid. The Dutch oil of cloves is extremely hot and fiery, and of a reddish brown colour, but it is greatly adulterated, both with fixed oils and resin of cloves. It is also falsified with pimento oil and Copaiba.

Med. use.—Cloves, considered as a medicine, are very hot, stimulating aromatics, and possess, in an eminent degree, the general virtues of substances of this class.

Off. Prep. of the clove.—Infusum caryophyllorum, *D. L.* Inf. aurantii comp. *D.* Mistura ferri aromatica, *D.* Spiritus lavandulæ comp. *D.* Vinum opii, *L. D.* Confectio aromatica, *D. L.* Electuarium scammonii, *D. L.*

Of the oil.—Pilulæ colocynthidis comp. *D. E.* Spiritus ammoniæ aromaticus, *L.*

EUPHORBIA.

Willd. *g.* 959. *Dodecandria Trigynia.* — Spr. *g.* 3076. *Monœcia Androgynia.*—Nat. ord. *Tricoccæ,* Linn., *Euphorbiaceæ,* Juss.

Spr. *sp.* 11; E. OFFICINARUM. *Lond.*

Spr. *sp.* 4; E. CANARIENSIS. *Dub.*

Officinal euphorbia *.

Officinal.—The gum-resin.

EUPHORBIÆ GUMMI RESINA. *Lond. Dub.*

EUPHORBIUM is produced from several species of the African genus *Euphorbia;* such as the *E. officinarum* of the Cape of Good Hope, the *E. Antiquorum,* which grows in Egypt, Arabia, and the East Indies, and is said to have furnished the Euphorbium of the ancients and that now imported by the Dutch, and the *E. Canariensis,* which furnishes that imported by the English from Barbary. Mr Jackson, in his account of Morocco, has given some information on this species. The inhabitants of the lower regions of Atlas make incisions into the branches of the plant with a knife, a corrosive milky juice issues, which, after being heated by the sun, becomes a substance of a whitish yellow colour, and in the month of September drops off, and constitutes Euphorbium. The plants produce abundantly only once in four years; but this fourth year's produce is more than all Europe can consume. The people who collect Euphorbium are obliged to tie a cloth over their mouth and nostrils, to prevent the small dusty particles from annoying them, as they produce incessant sneezing. The branches are used in the tanning of Morocco leather, and the juice is in great request among the women as a *depilatory.*

Euphorbium occurs in tears, or roundish and oblong masses, often branched, of the size of a pea or larger, perforated by one or two conical holes, in which are sometimes found the prickles of the plant, having the appearance of yellow wax, only paler, dull, smooth, fragile and friable.

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* *Syn.* Ευφορβιον, (*Diosc.*) Euphorbe, (*Fr.*) Euphorbium, (*Ger.*) Euforbio, (*It.*) Shadraykūllie paal, (*Tam.*) Bonstajemm doopaloo, (*Gel.*) Saynd ka dood, (*Duk.*) Aka nafsah, Farfiyūn, Gholak kala, (*Arab.*) Dalookgahehkerry, (*Cyng.*) Văjrăkshira, Văjrakăntăkă, (*Sans.*)

It has a very weak, if any, smell; but when thrown on live coals it burns with a bright flame and agreeable smell. Its taste is at first scarcely sensible, but afterwards acrid and corrosive. It is friable in the mouth, but soon dissolves in the saliva and causes a most painful burning. It also occurs in larger pieces, less pure, and often mixed with earthy matters. Its powder is yellowish, and requires to be made with great caution, as it excites violent sneezing and even inflammation of the eyes.

Euphorbium has been often analyzed, and the results have differed considerably. Landet got 23.3 *per cent.* of what he considered gum; but this appears, by later analysis, to have been malate of lime and potass. The most complete examination is that by Brandes, who got 43.8 resin; 13.7 cerine; 1.2 myricine; 4.8 caoutchouc; 23.7 malates, chiefly of lime and potass; 5.4 water; 5.6 lignine and impurities, with a little sulphate and phosphate of lime and potass and gluten = 100. It contained no volatile oil, gum or tragacanth. It is therefore improperly termed a gum-resin, but is a saline waxy resin, as denominated by Kastner.

The separated resin was of a dark reddish brown colour, in splinters of a brownish yellow, and transparent; its smell sweetish; its taste at first not remarkable, then pungent, exciting the salivary glands, and remarkably burning; its consistence dry, brittle, but receiving easily the impression of the nail; in the air permanent; in a platinum spoon it melts, and gets charred, with the evolution of the smell of benzoin, and much ebullition. It is soluble in ether, alcohol, oil of turpentine and of almonds, and partially in acids and alkalies. It therefore differs from the common resins chiefly in its pungency, in which it is analogous to the resin of black and Cayenne pepper, and to the bark of mezereon and pellitory root, with which Pfaff has associated it. Dissolved in alcohol, and applied to the skin, it excites, after a time, violent burning and great redness of the skin.

Med. use.—I know not with what intention it has been restored to the officinal materia medica of the London and Dublin Colleges. Bergius describes its virtue as purgative, drastic, inflaming, sternutatory and errhine, and says that it is used in caries of the bones, and in farriery in scabies (?) and wounds. Notwithstanding its great acrimony, it was used internally by the ancients; and some idea of their notions concerning it may be formed from the following quotation from Salmon's *Doron Medicum.* It is "hot and dry in the fourth degree. It purges phlegm and water, but inflames violently, especially the jaws and throat. It vexes the stomach and liver, and causes cold sweats. Oil of roses corrects it the best of any thing. Dose *à* gr. iij. *ad* gr. vi. Some will not admit it to be taken inwardly at all. If it be corrected with vinegar or flegm of vitriol, it may be given *à* gr. iv. *ad* gr. viij. as some say. It purges phlegm from the nerves, cures palsies, gouts, and convulsions, by using it inwardly and outwardly. Inwardly it may not be given till it is a year old, and then, if never so well corrected, gr. vi. or viij. is dose large enough, nor then ought it to be given without some other mixture."

FARINA. *Lond.* See TRITICUM.

FERRUM. *Lond. Dub. Ed.*
Iron *.

THIS is the most common of all metals. It seems even to be a constituent of organic substances, and is the only metal which, when taken into the body, exerts no deleterious action upon it. The numerous ores of iron which are found in every part of the globe may be reduced to the following genera. 1. Native iron: Immense isolated masses of this have been found in Siberia and in South America: their origin is still problematical. 2. Carburetted iron: *Plumbago.* 3. Sulphuretted iron: *Pyrites.* 4. Oxidized iron. *a.* Protoxide: Magnetic and specular iron ore. *b.* Peroxide: Not magnetic; red iron stone. *c.* Carbonated. *d.* Arseniated. *e.* Tungstated. *f.* Phosphated. *g.* Chromated. *h.* Sulphated. *i.* Silicated.

Iron is of a bluish grey colour; texture either fine grained, fibrous, or dense plates; sapid and odorous; specific gravity 7.600; the hardest, most elastic, and most tenacious metal; very ductile; fusing at 158° Wedgwood, fusion at first clammy, afterwards very fluid; igniting by strong percussion, and inflaming by the collision of flint; magnetic. It is oxidized slowly in the air, especially when moist; when heated in contact with air, it is oxidized; protoxide, consisting of one proportion of iron 3.5, and one of oxygen $1 = 4.5$, black, fusible, hard, brittle, lamellated, still attracted by the magnet; deutoxide, consisting of one proportion of iron 3.5, and one and a half of oxygen $1.5 = 5$, fine pulverulent, not attracted by the magnet. Iron burns with splendour and deflagration in oxygen gas, and is converted into a fused black oxide; it decomposes water slowly, and when ignited very rapidly. Iron is oxidized and dissolved by almost all the acids. It gives to glass a brown, smoky, deep green, or black colour. Carbon united to iron converts it into steel.

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* *Syn.* Mars, (*Off.*) Fer, (*Fr.*) Eissen, (*Germ.*) Ferro, (*Ital.*) Eerumboo, (*Tam.*) Loha, (*Duk. Hind.*) Eenumo, (*Tel.*) Loha, (*Sans.*) Hedeed, (*Arab.*) Bessee, (*Mal.*) Yakada, (*Cyng.*) Tee, (*Chin.*) Ahun, (*Pers.*)

Steel * is of a grey colour, brilliant and granular in its fracture; specific gravity 7.795; harder than any of the metals, and more elastic, ductile, malleable, and fusible at a lower temperature than pure iron. Its characteristic property is, that after being heated, if suddenly plunged into cold water, it becomes harder, more elastic, less pliable and brittle; but by being again heated and cooled slowly, it acquires its former softness, pliability, and ductility. Steel contains only some hundredth parts of carbon, and is known chemically by letting a drop of acid fall upon it, which produces a grey or black spot.

Plumbago † consists of about 1 *per cent.* of iron, combined with carbon.

As the mechanical division of iron is extremely difficult, it is directed to be kept in the shops in the states of filings or wire, and the scales of black oxide, which are found around the smith's anvil. Soft malleable iron is the only kind fit for internal use, as steel and cast-iron always contain impurities, and often arsenic.

Iron is officinal,

I. In its metallic state.
  1. *a.* Limatura ferri. *Ed.* Ferri ramenta. *Lond.* Scobs ferri. *Dub.* Lim. ferri purificata. *Ed.*
     b. Ferri fila. *Lond. Ed. Dub.*
  2. Sulphuretted,
     Sulphuretum ferri. *Ed. Dub.*
  3. Ferri cyanuretum, *Anglicè* Prussian blue. *Dub.*

II. Oxidized.
  1. Protoxide,
     a. Oxidum ferri nigrum. *Ed.* Squamæ oxydi ferri, *Dub.*
     b. Oxidum ferri nigrum purificatum. *Ed.* Oxydum ferri nigrum. *Dub.*
  2. Peroxide,
     Oxidum ferri rubrum. *Ed. Dub.*
  3. Carbonated,
     a. Subcarbonas ferri præparatus. *Ed.* Rubigo ferri. *Dub.*

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* *Syn.* Chalybs, (*Off.*) Acier, (*Fr.*) Stahl, (*Ger.*) Acciajo, (*It.*)

† *Syn.* Crayon noire, Graphite, (*Fr.*) Reisbley, dichter Graphite, (*Ger.*) Piombagine, (*It.*)

b. Carbonas ferri præcipitatus. *Ed.* Ferri subcarbonas. *Lond.* Carbonas ferri. *Dub.*
Mistura ferri comp. *Lond. Dub.*
Pilulæ ferri comp. *Lond. Dub.*
4. Supercarbonated; as in the chalybeate mineral waters.
5. Sulphated,
Ferri sulphas. *Ed. Lond. Dub.*
Pilulæ sulphatis ferri comp. *Ed.*
6. Subsulphated,
Sulphas ferri exsiccatus. *Ed.*
7. Muriated,
Tinctura muriatis ferri. *Ed. Lond.* Muriatis ferri liquor. *Dub.*
8. With muriate of ammonia,
Murias ammoniæ et ferri. *Ed.* Ferrum ammoniatum. *Lond.*
Tinctura ferri ammoniati. *Lond.*
9. Acetated,
Acetas ferri. *Dub.*
Tinctura acetatis ferri. *Dub.*
10. With nitrate of potass,
Liquor ferri alkalini. *Lond.*
11. With tartrate of potass,
Ferrum tartarizatum. *Lond.* Tartras potassæ et ferri. *Ed.* Tartarum ferri. *Dub.*
Vinum ferri. *Lond.*
12. With cinchonic acid,
Mistura ferri aromatica. *Dub.*

FERRUM, Ferri ramenta et fila. *Lond.* FERRI FILA. FERRI LIMATURA. *Ed.* FILA; SCOBS. *Dub.*

Iron. Iron-filings. Iron-wire *.

Med. use.—The general virtues of this metal, and its preparations, are, to constringe the fibres, to quicken the circulation, to promote the different secretions, and, at the same time, to repress inordinate discharges in the intestinal tube. By the use of chalybeates, the pulse is very sensibly raised; the colour of the face, though before pale, changes to a florid red; the alvine, urinary, and cuticular excretions, are increased. Fetid eructations, and black coloured fæces, are marks of their taking due effect.

When given improperly, or to excess, iron produces headach and anxiety, heats the body, and often causes hæmorrhagies, or even vomiting, pains in the stomach, and spasms and pains of the bowels.

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* *Syn.* Fil de fer, (*Fr.*) Eisendraht, (*Ger.*) Fil de ferro, (*It.*)

Iron is given in most cases of debility and relaxation. 1. In passive hæmorrhagies; 2. In dyspepsia, hysteria, and chlorosis; 3. In most of the cachexiæ, and it has been lately recommended as a specific in cancer; 4. In general debility produced by disease, or excessive hæmorrhage; 5. In neuralgia. Where either a preternatural discharge, or suppression of natural secretions, proceeds from languor and weakness, this metal, by increasing the motion of the fluids, and the strength of the solids, will suppress the flux, or remove the suppression; but where the circulation is already too quick, the solids too tense and rigid, where there is any stricture or spasmodic contraction of the vessels, iron and all its preparations will aggravate both distempers.

Iron probably has no action on the body when taken into the stomach, unless it be oxidized. But during its oxidizement, hydrogen gas is evolved; and, accordingly, we find that fetid eructations are considered as a proof of the medicine having taken effect. It can only be exhibited internally in the state of filings, which may be given in doses of from five to twenty grains, either in the form of powder, with some aromatic, or made into an electuary or bolus or pills with any bitter extract. Iron-wire is to be preferred for pharmaceutical preparations, both because it is the most convenient form, and because it is always made of the purest iron.

Off. Prep.—Ferri rubigo, *D.* Ferri sulphas, *D. E. L.* Ferri tartarum, *D.* Mistura ferri aromatica, *D.* Ferri sulphnretum, *D. E.* Limatura ferri purif. *E.* Ferrum tartaris. *L.* Liquor ferri alkalini, *L.* Vinum ferri, *L.*

FERRI OXIDUM NIGRUM. *Ed.* OXYDI SQUAMÆ. *Dub.*

The scales of iron. The scales of the oxide [*].

WHEN iron is heated to redness in the smith's forge, to render it more malleable, its surface becomes oxidized by the action of the atmospheric air; and as the oxide formed does not adhere to the iron, it is easily separated by percussion on the anvil, and flies off in the state of sparks, which constitute the scales of iron. In these the iron is oxidized to that degree in which it is soluble in acids, without the production of hydrogen gas; therefore, when taken into the stomach, they do not produce the distention and flatulence occasioned by the use of the filings. In the Parisian codex there is a formula for preparing the protoxide from iron-filings and water.

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[*] *Syn.* Battitures de fer, (*Fr.*) Eisenschlag, (*Ger.*) Scaglia di ferro, (*It.*)

Off. Prep.—Ferri oxydum nigrum, *D.* Ferri oxid. nigr. purif. *E.*

SULPHAS FERRI. *Ed. Lond.*
Sulphate of iron. Green vitriol. Copperas *.

THE sulphate of iron of commerce is commonly obtained by the spontaneous oxidizement of sulphuretted iron, and sulphate of alumina is often formed at the same time, but the alum and copperas are separated by means of their different crystallizability, and subsequent lixiviation and crystallization. Sulphate of iron thus obtained is never pure, and often contains zinc or copper. The copper may be separated by adding some metallic iron to the solution; but we have no means of separating the zinc; therefore, in order to obtain it in a state of purity, we must prepare it by dissolving iron in diluted sulphuric acid. Its crystals are transparent rhomboidal prisms, of a fine green colour. They are soluble in two parts of cold, and in less than their own weight of boiling water. They are insoluble in alcohol.

They are composed of one atom of sulphuric acid, 5; one of protoxide of iron, 4.5; seven of water, 7.875 = 17.375.

Green sulphate of iron is decomposed by all the earths and alkalies, and by those salts whose base forms an insoluble compound with sulphuric acid. It is also decomposed by exposure to the air, especially when in solution, and by all substances which part readily with their oxygen. The oxide of iron absorbs oxygen, and passes to the state of red oxide, which forms a red sulphate, possessing properties very different from those of the green sulphate.

Med. use.—Taken internally, the green sulphate in considerable doses is apt to excite pain in the stomach, and spasms in the bowels; and in large doses it causes vomiting. In small doses, however, of from one to three grains, it is often given as a tonic, astringent, or anthelmintic.

Off. Prep.—Pilulæ sulphatis ferri comp. *E.* Sulphas ferri exsiccat. *E.* Ferri oxidum rubrum, *D.* Pilulæ ferri comp. *L. D.* Ferri carbonas, *D.* Ferri subcarbonas, *L.* Carbonas ferri precipitatus, *E.* Mistura ferri comp. *L.*

FERRI CYANURETUM. *Dub.*
Prussian blue.

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* *Syn.* Vetreol ver, Cooperose, (*Fr.*) Grüne Vitriol, (*Ger.*) Vetriolo verde, (*It.*) Anna baydie, (*Tam.*) Heera cashish, (*Duk.*) Taroosee, (*Mal.*) Casis, (*Hind.*) Zunkar madenee, Tootya subz, (*Pers.*)

Prussian blue * is prepared by mixing equal parts of pearl ash and any animal matters, as dried blood, or parings of horn. They are then calcined to redness in a crucible, allowed to cool, and thrown into water. The filtered ley is added to a mixed solution of two parts of alum and one of green vitriol. The precipitate obtained is at first of a blackish brown colour, but by means of a great many washings with water slightly acidulated, and of the contact of the air, it gradually passes to a deep blue. When in this state it is put upon a linen filter to drain, and then dried. In this process the potass is reduced, and converted into potassium, with which part of the carbon and nitrogen of the animal matter, in the form of cyanogen, unites, and forms cyanuret of potassium, mixed with undecomposed carbonate of potassa. When this is dissolved in water it is decomposed, and part of it is converted into hydrocyanate of potass, which, when added to the solution of protosulphate of iron, throws down a precipitate, consisting chiefly of protoxide of iron and alumina. The solution contains hydrocyanate of potassa, upon which the protoxide reacts, partly converting the hydrocyanic acid into ferrocyanic acid, which combines with the remainder of the protoxide; and when this acquires its maximum of oxidation, the compound has the deep blue colour peculiar to the perferrocyanate of iron.

The Prussian blue of commerce, which contains much alumina, is in small square cakes of a deep blue colour, which has, like indigo, a fracture like bronze, but easily distinguished by its metallic appearance being removed by friction with the nail, while that of indigo is increased. It is also heavier than indigo, and by heat, in a close vessel, leaves 59 *per cent.* of its weight of a black pyrophorus, which, by complete combustion, with contact of the air, passes into red oxide of iron with alumina.

To prepare a pure Prussian blue without alumina, Buchner directs a solution to be made of commercial ferrocyanate of potass, in warm distilled water, and to add to it in a flask a solution of fine sulphate of iron, as long as any precipitate is thrown down. The supernatant liquid contains sulphate of potass, and the precipitate, after separation, is washed with dilute sulphuric acid, to remove any oxide of iron that may be present, and the fine blue precipitate is then collected on a filter, washed with boiling water, and dried.

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* *Syn.* Bleu de Prusse, (*Fr.*) Berliner Blau; Preussisch Blau, (*Ger.*) Azzuro di Berlino, (*It.*)

Med. use.—Dr Zollikofer used it in remittent and intermittent fevers. He gave for a dose one grain several times a-day, in preference to cinchona. It is tasteless, and children take it readily. It also acts quicker and more certainly; and 4-9 grains daily, in every three hours, suffice. Dr Kirchhoff of Ghent prescribed it in epilepsy, and succeeded in cases which had lasted for years. He begins with small doses; half a grain daily for an adult, and gradually increases it to 3-6 grains or more. If the patient is plethoric, he premises venesection, or leeches, to the temples. It is also applied externally in bad, and even cancerous, ulcers. One drachm may be rubbed on with an ounce of spermaceti ointment.

FERULA ASSAFŒTIDA. *Ed. Lond. Dub.*

Willd. *g.* 539, *sp.* 11; Spr. *g.* 1085, *sp.* 5. *Pentandria Digynia.*—Nat. ord. *Umbellatæ,* Linn. Juss.

Assafœtida *.

Off.—The gum-resin.

GUMMI RESINA FERULÆ ASSÆFŒTIDÆ. *Ed.* ASSAFŒTIDÆ GUMMI RESINA. *Lond.* GUMMI RESINA. *Dub.*

THE plant which furnishes assa fœtida is perennial, and a native of the south of Persia. The gum-resin is procured from the roots of plants which are at least four years old. When the leaves begin to decay, the stalk is twisted off, and the earth removed from about their large tapering roots. The top of the root is some time afterwards cut off transversely; and in forty-eight hours, the juice which has exuded is scraped off, and a second transverse section is made. This operation is repeated until the root be entirely exhausted of juice. After being scraped off, the juice is exposed to the sun to harden.

It is brought to us in amorphous masses, of the consistence of wax, composed of agglutinated tears, which are whitish, but by the contact of the air become rosy or reddish, never brown, sometimes subdiaphanous, of a greasy lustre, tough, becoming soft under the fingers, of a bitterish acrid taste, and a nauseous alliaceous smell. They burn readily. When macerated in water they give a turbid red solution, the undissolved portion resembling chalk; and when triturated with water they form a tolerably permanent white emulsion. They are only partially soluble in alcohol, making a yellowish red solution. They are totally dissolved in a solution of potassa in alcohol. Those masses are to be selected which are clear, of a pale reddish colour, and variegated with a great number of elegant white tears, and they should not, on burning, smell of pitch. It loses some of its smell and strength by keeping, and it should be preserved in bladders, shut up in tin boxes, and these kept in a drawer by themselves.

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* *Syn.* Stercus Diaboli, (*Off.*) Assafetida, (*Fr. It.*) Stinkinder Asand, (*Ger.*) Ungoozeh, (*Pers.*) Perungyum, (*Tam.*) Injoova, (*Tel.*) Hinga, Hingoo, (*Sans.*) Hing, (*Duk. Indos.*) Angoo, (*Malay.*) Hiltect, (*Arab.*) Hinghoo, (*Cyng.*) Ingu, (*Jav.*) Hingu, (*Bali.*)

Assafœtida has been analyzed by M. Pelletier: Resin, 65.00; gum, 19.44; bassorine, 11.65; volatile oil, 3.60; supermalate of lime, some traces; loss, 0.30 = 100. Brandes, with his usual accuracy and minuteness, got 46 volatile oil, a trace of phosphorus, 472.5 of resin, 16 of resinoid, 194 of gum, with traces of acetate, malate, sulphate and phosphate of potass and lime, 64 of tragacanthine, 10 of extractive with malate of potass, 62 of sulphate of lime with traces of sulphate of potass, 4 of malate of lime with resin; 35 of carbonate of lime; 4 of oxide of iron and alumina; 60 of water, and 46 of impurities = 1013.5. The smell and taste depend entirely upon the volatile oil, which adheres strongly to the resin. Its resin is peculiar in the blue colour of its solution in alkalies, and it seems to enter into intimate combination with them. The resinoid or hard resin seems to occur in many vegetables, and to have the same relation to resin that tragacanth has to gum. From the large proportion of saline matter, Brandes thinks it should be considered as a *saline gummy resin.*

The seeds of a congenerous species growing in the north of Persia, the *Ferula Persica*, sent by Dr Guthrie of St Petersburgh to Dr Hope, produced fertile seeds in the open air at Edinburgh, from which the plant has been disseminated in the gardens of the curious.

Med. use.—It is the most powerful of all the fetid gums, and is a most valuable remedy. It acts as a stimulant, antispasmodic, expectorant, emmenagogue, and anthelmintic. Its action is quick and penetrating.

It is often serviceable, 1. In spasmodic croup; 2. In dyspepsia, amenorrhœa, and chlorosis; 3. In asthma, dyspnœa, and hysteria; 4. In tympanites and worms.

It is exhibited, 1. In substance, in the form of pills, in doses of from five to twenty grains, either alone, or combined with bitter extracts or purgatives; 2. Dissolved in some simple distilled water; 3. Dissolved in alcohol; 4. In the form of clyster, to the extent of about two drachms.

Off. Prep.—Mistura assafœtidæ, *D.* Tinct. assæfœtidæ, *D.* Spiritus ammoniæ fœtidæ, *D.* Pilulæ galbani comp. *D.*

FICUS CARICA. *Ed. Lond. Dub.*

Willd. *g.* 1931, *sp.* 1. *Polygamia Diœcia*, Linn., *Diœcia Triandria*, Persoon. *Monœcia Androgynia*, Spr. *g.* 3075, *sp.* 107.—Nat. ord. *Scabridæ*, Linn., *Urticeæ*, Juss.

The fig-tree *.

Off.—The preserved fruit.

FRUCTUS FICUS CARICÆ. Fructus siccatus. *Ed. Dub.* Fructus exsiccatus. *Lond.*

THIS tree is probably a native of Asia, but grows plentifully in the south of Europe. The fig-tree has been celebrated from the earliest ages.

The fruit, or rather fleshy receptacle, is turbinated, of the size of a small pear, of various colours, rounded and obtuse towards the summit, which is umbilicated; umbilicus orbicular, slightly prominent, and shut before maturity; parenchyme fleshy, succulent, yellow or reddish, viscid and saccharine, inclosing a great number of small round seeds; without smell; taste mild, saccharine, and mucilaginous. There are many varieties of figs differing in flavour; in colour white, yellow, greenish, or reddish, violet or brownish, and in shape long or flat. In France the fig of Marseilles is preferred to all others.

The fresh fig is much esteemed by those accustomed to them, but are supposed to be less nutritious than the dried fig, which is the state in which they are officinal. In the south of France, they dry almost all the early figs; and the quantity is so abundant, that they give them to animals for food. The drying is performed by exposing them to the sun, and from eight to ten days are sufficient.

The figs used in this country are chiefly brought from the Levant. I know of no analysis, but they consist almost entirely of sugar and mucilage.

Med. use.—They are simple demulcents, and as such enter into demulcent decoctions and lenitive electuaries. They also form a very convenient suppurating cataplasm, either roasted or boiled, and applied as hot as can be borne to parts where other cataplasms cannot easily be kept applied.

Off. Prep.—Decoctum hordei comp. *D. L.* Confectio sennæ, *D. L.* Electuarium sennæ comp. *E.*

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* *Syn.* Figues, (*Fr.*) Getroknete Feigen, (*Ger.*) Fighi, (*It.*) Simie attie pullum, (*Tam.*) Maydipoondoo, (*Tel.*) Unjeer, (*Pers. Duk.*) Teen, (*Arab.*) Rato Attika, (*Cyn.*) Udumvara, (*Sans.*)

FRAXINUS ORNUS. *Lond. Ed. Dub.* See MANNA.

FUCUS VESICULOSUS. *Lond. Dub.*

Spr. *g.* 3386, *sp.* 1.—Nat. ord. *Algæ*, Linn. Juss.

Off.—Yellow bladder wrack.

FUCUS. *Lond.* Herba cum fructu. *Dub.*

THIS is one of the most common sea-weeds which grows on our shores. It is of great value in the manufacture of kelp. It is also used as a manure, and is sometimes dried and mixed with the fodder of cattle. It is even eaten in times of scarcity by the inhabitants of some of the Western Islands.

Its analysis is still very imperfect, as those who have undertaken it have attended more to the products of combustion than to the proximate principles of which it is composed. Professor John found in it, of brownish red glairy matter, and flesh-coloured extractive, with a little sulphate and muriate of soda, 40; a peculiar acid; a greasy resin, 20; sulphate of soda, with a little muriate, 30.3; sulphate of soda, with much sulphate of magnesia, and a little phosphate of lime, 128.7; traces of iron and magnesia, and albuminous matter, or albumen of the fuci, 780=1000. It is this last constituent which deserves to be examined; as I doubt its being correctly denominated albumen; at least, in another species, the *fucus endiviæfolius* of Lightfoot, the carrageen of the Irish, lately brought into notice as a demulcent food, I find, that by boiling, its parenchyme is almost entirely dissolved, and converted into a mucilage, which gelatinizes on cooling, and has the valuable property of keeping much longer without spoiling than either animal or starch jelly. Gaultier-Claubry found in the *F. v.* mannite or saccharine matter, albumen and chlorophylle, with saline matters consisting of oxalic, malic, sulphuric, muriatic, hyposulphuric, carbonic, hydriodic, and phosphoric acids, combined with potash, soda, magnesia, lime and oxide of iron; also silica. Stackhouse, who examined it by destructive distillation, got water, 276; ammonia, (carbonate?) 180; charcoal, 172; empyreumatic oil, 108; gases, carbonic acid, 120; azote, 6; oxygen, 26; carburetted hydrogen, 2; loss, 4.2=100.

Med. use.—In medicine it is little used; though Dr Russel recommended the mucus of the vesicles as a resolvant, when applied externally to scrofulous swellings. The charcoal obtained by burning it in close vessels has in some places got the name of *Æthiops vegetabilis.* It used to be considered merely as a compound of charcoal and carbonate of soda, and as such was neglected; but it contains also *iodine*; and since Dr Coindet's discovery of *iodine* as a specific in bronchocele and strumous affections, its effects are deserving of being again studied.

GALBANUM. *Lond. Dub.* See BUBON.

GALLA, ex variis quercus speciebus. *Ed.* GALLÆ, Cynipis quercusfolii nidus. *Lond.* GALLÆ. *Vide* QUERCUS INFECTORIA. *Dub.*

Nutgalls *.

EXCRESCENCES are produced on several species of the oak tree, in consequence of the puncture of an insect, for the purpose of depositing an egg in the bark. Besides the species from which the officinal nutgalls are produced, they are found on the *Quercus Aegitops* and *Q. Esculus*, which grow in the Levant and south of Europe, and also upon the European species, the *Q. Robur* and *Q. Cerris*.

Olivier has, in his travels in the Ottoman Empire, given us an accurate botanical description of the oak which produces the officinal nutgall. He calls it *Quercus infectoria*. It is scattered through all Asia Minor. It has a crooked stem, and seldom reaches the height of six feet. It oftener has the appearance of a shrub than of a little tree. The nutgalls come at the shoots of the young boughs, and are produced by the puncture of *diplolepsis gallæ tinctoriæ* of Geoffroy, the *Cynips quercusfolii* of Linnæus, to deposit an egg. The galls are in perfection when they have acquired their full size and weight, but before the insect has pierced them, after which they get a brighter colour, and lose some of their weight. The galls first picked are laid apart, and are called *Black* and *Green* galls. Those gathered later are called *White* galls, and are very inferior in value.

Nutgalls are tubercles of a roundish shape, of different sizes, from 4 to 12 lines in diameter, sometimes smooth, sometimes covered with spines, often with one small perforation, of an ash grey, or greenish or blackish brown colour. Their parenchyme is solid, fragile, whitish, brown or blackish, and hollow in the centre, having no smell, and a very astringent taste. Powder of a grey colour, more or less intense. Those which are heavy and not perforated are preferred; and the paler, reddish, perforated galls with a loose parenchyme are to be rejected. It is said by Fee that there are factitious galls made of clay.

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* *Syn.* Noix de galle, Galles d'Alep, (*Fr.*) Galläpfel, (*Ger.*) Galle, Noce di galla, (*It.*) Māchákāi, (*Tam.*) Māphul, (*Duk.*) Afis, (*Arab.*) Māzu, (*Per.*) Majouphul, (*Hind.*) Machikai, (*Fel.*) Maju-phăl, (*Sans.*) Massaka, (*Cyng.*)

Nut-galls are the most powerful astringents we possess, and, since the discovery of the tanning principle by M. Seguin, have very much engaged the attention of chemists. The most minute analysis is that of Sir H. Davy, who found that 500 grains of good Aleppo galls gave, by lixiviating them until their soluble matters were taken up, and evaporating the solution slowly, 185 grains of solid matter, which, when examined by analysis, appeared to consist of, tannin, 130; mucilage, and matter rendered insoluble by evaporation, 12; gallic acid, and a little extractive matter, 31; remainder, calcareous earth and saline matter, 12=185.

From accurate experiments made by myself, I am disposed to think that Sir H. Davy has underrated the tannin of nut-galls; for by simple repeated infusions in hot water, the residuum of 500 grains in one experiment amounted only to 158, and in another to 136 grains. The quantity of tannin, estimated in Sir H. Davy's method, amounted in the first to 220 grains, and in the second to 256. The analysis requires to be repeated by a skilful chemist to decide between us. A saturated decoction of galls, on cooling, deposites a copious pale yellow precipitate, tannate of starch. In my experiments, a very weak infusion of nut-galls was precipitated by sulphuric acid, lime-water, subcarbonate of potass, acetate of lead, sulphate of copper, nitrate of silver, sulphate of iron, tartrate of antimony, nitrate of mercury, infusion of cinchona, opium, and many other vegetable substances, and solution of gelatine; it was not precipitated by nitrous acid, ammonia, sulphate of zinc, muriate of mercury, solution of quassia, or infusion of saffron. Sir H. Davy has concluded, that tannin and gelatine unite in fixed proportions, viz. 46 of tannin with 54 gelatine, and this has been received as established by chemists. Were this correct, it would very much facilitate the analysis of astringents, but unfortunately neither my experiments nor those of Dr Bostock confirm it. The precipitate of tannin and gelatine, in boiling water, becomes soft and viscid, and a certain portion is dissolved, which separates again when the solution cools. I may also remark, that if the precipitate be dried without any heat, it has a yellowish white appearance, opaque, and without lustre; but if exposed to a very moderate increase of temperature before it be dry, it seems to undergo a kind of watery fusion, and acquires transparency, a dark brown-red colour, and a resinous lustre. Sir H. Davy discovered that it is soluble in excess of gelatine. It is also extremely soluble in ammonia, forming a red solution.

Med. use.—An infusion or decoction of galls may be used with advantage as an astringent gargle or lotion. The tincture, either alone or diluted, is a good dentifrice; and an officinal ointment is applied with success in hæmorrhoidal affections.

Off. Prep.—Tinctura gallarum, *D. E.* Unguentum gallarum, *D. E.*

GAMBOGIA. Gummi resina ex Stalagmitide Cambogioide et quibusdam aliis arboribus. *Ed.* GAMBOGIA. *Vide* STALAGMITIS. *Dub.* CAMBOGIA. Stalagmitis Cambogiöides; Gummi resina. *Lond.*

Gamboge; gum gutt *.

ALTHOUGH there be no doubt that gamboge is the concrete juice of a tree belonging to the natural family of *Guttiferæ* of Juss., botanists are not agreed about the individual species. The British colleges, following the authority of Koenig, specify *Stalagmitis cambogioides,* which Persoon now ranks among the *Polyandria monogynia;* while Persoon, Richard, Decandolle, and others, name the *Garcinia cambogia,* which belongs to the *Dodecandria monogynia.* But Dr White, who was well acquainted with this latter, distinctly denies that its concrete juice has the properties of gamboge. Other species of garcinia yield a yellow concrete juice. Some of the rind of the fruit of another species, *G. mangostana,* was sent to me as a native remedy in dysentery, upon which portions of a yellow concrete juice are adhering, apparently more resinous than true gamboge. I owe also to the attention of my friend, David Anderson Blair, a splendid specimen of the yellow juice of the *Stalagmitis,* concreted on the bark, as well as specimens of the fruit and leaves; and I can affirm, that it has not the properties of true gamboge.

Genuine gamboge all comes from Siam; and the tree has not yet been seen by any European botanist, unless fortunately it may have fallen under the observation of Dr Wallich, during his late sojourn in the Birman empire: we only know that the gum-resin is obtained in drops, by breaking the leaves and young shoots; hence probably its name, *Gummi-gutta.*

Gamboge is brought to Europe from the East Indies. The best is made up in rolls of an inch or two in diameter, sometimes solid, and sometimes hollow, and occasionally folded double, or several agglutinated together. Externally its surface is striated, from the impression of a monocytelous leaf, slightly cracked, of a dull orange colour, except where it is stained green, probably from the leaves with which it has been covered when soft, and when some of its own powder, of a bright yellow colour, adheres, which it does very partially. It is brittle, fracture conchoidal, very compact, even, of a deep orange yellow, waxy, rather than resinous lustre. Fragments wedge-shaped, slightly translucent at the edges; easily pulverizable, not friable; powder bright yellow, loose. When chewed not softening under the teeth, and scarcely adhering to them; immediately making with the saliva a citrine-coloured emulsion.

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* *Syn.* Gomme gutte, (*Fr.*) Gummigutt, (*Ger.*) Gomma gotta, (*It.*) Mukki, (*Tam.*) Ossara rewund, (*Arab.*) Gokkatoo, (*Cyng.*) Passa poorenny, (*Tel.*)

It occurs also in solid flat cakes, of an inch or two in thickness, surface wrinkled, colour dull orange, with more yellow powder, fracture uneven, slightly porous, colour less bright, lustre more resinous. It has no smell, and very little taste; but after being kept in the mouth for some time, it excites a durable sense of acrimony in the fauces.

Gamboge is a gum-resin, characterized by several peculiarities. It contains no volatile oil. It is not fusible by heat, but burns with much smoke; and it is easily and entirely diffusible through water, forming a yellow emulsion, from which the colouring matter subsides very slowly. It is almost entirely soluble in alcohol, forming a golden-yellow tincture, which is decomposed by water, forming an emulsion as above. It is entirely soluble in ammoniated alcohol, and this solution is not decomposed by water. It is soluble in alkaline solutions, acquiring a deep red colour, and also in acids; but the acid solution is decomposed by water, and yields a yellow precipitate in combination with a proportion of the acid.

These properties have received the confirmation, or are the result of my own experiments. Braconnot has also analyzed gamboge. He describes it as consisting of an acid gum, resembling cherry gum, 20; and of a red resin, insipid, transparent, fragile, becoming yellow by trituration, having all the properties of resins, but seeming to consist of a resinous principle, and a yellow principle from which it derives its colour, 80 = 100.

Med. use.—Gamboge acts powerfully on the alimentary canal, and is often given as a purgative when the bowels are torpid.

It is used in dropsy with cream of tartar or jalap, or both, to quicken their operation. It is an ingredient, and probably the active one, in most of the nostrums for expelling the tape worm; and it has been given by some in this disease, to the extent of fifteen grains, with an equal quantity of vegetable alkali. This dose is ordered in the morning; and if the worm is not expelled in two or three hours, it is repeated even to the third time with safety and efficacy.

Off. Prep.—Pil. Gambogiæ comp. *E. D. L.*

GENTIANA LUTEA. *Ed. Lond. Dub.*

Willd. *g.* 512, *sp.* 1; Spr. *g.* 1001, *sp.* 24. *Pentandria Digynia.*—Nat. ord. *Rotaceæ,* Linn., *Gentianeæ,* Juss.

Gentian *.

Off.—The root.

RADIX. *Ed. Lond. Dub.*

GENTIAN is a perennial plant which grows upon the Alps, Pyrenees, Apennines, and other mountainous situations in the temperate parts of Europe.

The roots are about an inch thick, or a little more; trunk annulated, with few branches, and scarcely any radicles; branches striated and wrinkled; externally reddish brown; internally, especially when moistened, reddish yellow; with a thickish bark, and a thick spongy wood; smell weakly aromatic; taste at first sweetish, then intensely bitter; powder yellow. They also occur of a smaller size and paler colour, derived from other species of gentian, and not to be rejected; but the intermixture of white hellebore roots is to be cautiously guarded against.

Neumann got from 960 grains 390 alcoholic, and afterwards 210 insipid watery extract; and inversely, 540 watery, and only 20 alcoholic. Henry and Caventou found in gentian root a fleeting colouring principle; a yellow crystalline bitter, *Gentianine;* birdlime; fixed greenish oil; a free organic acid; uncrystallizable sugar; gum; yellow colouring matter, and lignine. The roots boiled in water, and fermented, yield a spirit which is much prized by the Swiss, although it has a peculiar flavour and a bitter taste.

Gentianine is easily obtained in a crystalline form by means of ether, in which it is very soluble. It likewise dissolves in alcohol, and more sparingly in water. It is very bitter, has no smell, and appears to be neither alkaline nor acid.

Med. use.—Gentian possesses the general virtues of bitters in an eminent degree, and it is totally devoid of astringency. On dead animal matter it acts as an antiseptic. Taken into the stomach, it proves a powerful tonic, and in large doses it evacuates the intestines. It is useful in weakness of the

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[*] *Syn.* Gentiane jaune, (*Fr.*) Gelber Enzian, (*Ger*) Genziana maggiore, (*It.*)

stomach, and in general debility. Externally, its powder is applied to malignant ulcers. Narcotic effects have sometimes been ascribed to it, but these are owing to the roots of narcotic plants gathered along with it.

Off. Prep.—Infusum gentianæ comp. *D. L. E.* Tinctura gentianæ, *D. L. E.* Extractum gentianæ, *D. L. E.* Vinum gentianæ comp. *E.*

GEOFFROYA INERMIS. *Dub.* Geoffræa inermis. *Ed.*

Willd. *g.* 1362, *sp.* 3; Spr. *g.* 2609, *sp.* 2. *Diadelphia Decandria.* — Nat. ord. *Papilionaceæ,* Linn., *Leguminosæ,* sect. *Papilionaceæ,* Juss.

Cabbage tree *.

Off.—The bark.

CORTEX GEOFFRÆÆ INERMIS. *Ed. Dub.*

THIS genus has now got the name of *Andira.* The species quoted grows in the low savannahs of Jamaica, but the G. Surinamensis (Andira retusa var. Surinamensis, De Cand.) is that which is officinal on the Continent. They are probably similar in virtues.

The Jamaica bark is ash brown externally, covered with scales, and eroded by lichens, yellow interiorly; fracture resinous; smell nauseous; taste mucilaginous and sweetish; powder resembles that of jalap. The Surinam bark has a greyish epidermis, covered with lichens; bark brown, lamellated, very tough, compact; when cut across, brilliant and variegated brown, when recent, nauseous; no smell when dried; taste a little acrid and bitter; powder pale cinnamon. It has not been analyzed by any modern chemist.

Med. use.—The medical effects of this bark are much greater than its sensible qualities would lead us to expect. When properly exhibited, it operates as a powerful anthelmintic, especially in cases of lumbrici. It is given in form of powder, decoction, syrup, and extract, but should always be given in small doses. The decoction is preferred. It commonly produces some sickness and purging; sometimes violent effects, as vomiting, delirium and fever. These last are said to be owing to an over-dose, or to drinking cold water during its operation; and are relieved by the use of warm water, castor oil, or a vegetable acid.

Off. Prep.—Decoctum Geoffroyæ, *E. D.*

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* *Syn.* Geoffroya de la Jamaique, (*Fr.*) Wurmrinde, Geoffrearinde, (*Ger.*) Geoffroea, (*It.*)

GEUM URBANUM. *Dub.*

Willd. *g.* 1002, *sp.* 3; Smith, *g.* 237, *sp.* 1; Spr. *g.* 1865, *sp.* 1. *Icosandria Polygynia.* — Nat. ord. *Senticosæ,* Linn., *Rosaceæ,* sect. *Fragariæ,* Juss.

Common avens. Herb Bennet *.

Off.—The root.

RADIX. *Dub.*

AVENS is an indigenous perennial plant, common in shady uncultivated places. It flowers from May to August. The young root is merely fibrous. When older it consists of a short oblong rhizoma, of the thickness of a writing quill, emitting, especially from the apex, numerous, long, intricate fibres, externally of a brown colour, covered with blackish subimbricated scales; substance of an ash or pale red; when divided horizontally, exhibiting a circular medullary centre, surrounded by a thin ring of subcontiguous points. Smell when recent, resembling that of cloves; when dry, weak. Taste bitterish and astringent. It must be dug up in spring, when the leaves begin to appear. It tinges both water and alcohol red. Water distilled from it has a pleasant flavour, and carries over a little thickish essential oil. It has been recently analyzed by Melandri and Moretti, who got from two ounces 118 grains of tannin, 181 extractive, 61 of saponaceous extract and saline matter, 92 of mucous extract, 23 of resin, 496 of woody fibres, and 76 of volatile oil, water and loss.

Med. use.—Avens is an old febrifuge mentioned by Ray, but again brought into notice by Buckhaave. Half a drachm or a drachm of the powder may be given four times a-day. Two table spoonfuls of the decoction may be given every hour, or a table spoonful of a tincture, made with an ounce of the root to a pound of alcohol, three or four times a-day. As an indigenous astringent it deserves notice.

GLYCYRRHIZA GLABRA. *Ed. Lond. Dub.*

Willd. *g.* 1366, *sp.* 4; Spr. *g.* 2521, *sp.* 1. *Diadelphia Decandria.*—Nat. ord. *Papilionaceæ,* Linn., *Leguminosæ,* sect. *Papilionaceæ,* Juss.

Liquorice †.

Off.—The root and the extract.

a) RADIX. *Ed. Lond. Dub.*

b) EXTRACTUM. *Ed.*

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* *Syn.* Caryophyllata, (*Off.*) Benoite, (*Fr.*) Gemeiner Nelkenkraut, (*Ger.*) Cariofilata, (*It.*)

† *Syn.* Liquiritia, (*Off.*) Bois de reglisse, (*Fr.*) Süssholz, (*Ger.*) Legorizia, (*It.*)

Liquorice is a perennial plant, and a native of the sout of Europe; but the roots, which are raised for medical purposes in considerable quantities in England, are preferred to those imported from abroad, which are very frequently mouldy and spoiled. The roots are very long, about an inch thick, flexible, fibrous, externally of a brown colour, internally yellow, and when fresh, juicy. Their taste is very sweet, combined with a slight degree of bitter when long kept in the mouth. It is necessary to preserve them in a very dry place, as they are extremely apt to spoil. They are prepared for use by peeling them, and cutting away all the fibres and decayed parts.

The powder of liquorice usually sold is often adulterated. The best sort is of a brownish yellow colour, and of a very rich sweet taste, much more agreeable than that of the fresh root.

Robiquet obtained from liquorice root, 1. Amylaceous fecula; 2. A saccharine substance differing much from sugar, *Glycion;* 3. A crystalline substance, the *Agedoite* of Desvaux; 4. A resinous oil, which is the cause of the acrimony in the decoctions; 5. Phosphate and malate of lime and magnesia; 6. Woody fibre.

The sweetness of the liquorice root is said by Robiquet to depend upon a peculiar principle, called by him *Glycyrrhizine* or *Glycion.* He prepared it by subjecting a strong cold infusion of the root to ebullition, which separated a coagulable matter. It was then filtered, and acetic acid added, which gradually threw down a gelatinous magma, which, being washed with a little cold water to separate any adhering acid, he considered as pure *Glycion.* Its taste is peculiar and intensely sweet, and its smell, when thrown on hot coals, is rather resinous than like caromel. It is sparingly soluble in cold water, but readily in hot, and gelatinizes on cooling. It is readily soluble in alcohol even without heat, and is incapable of the vinous fermentation.

According to Berzelius, however, this is not pure glycion, but a compound of it with acetic acid. He precipitates the infusion of liquorice root with sulphuric acid, and washes the precipitate with water till it acquires no acid taste. He then dissolves the sulphate of glycion in alcohol, which leaves albumen undissolved. To the solution he adds carbonate of potass, in fine powder, to perfect neutralization, sets the liquor aside for the sulphate of potass to separate, and evaporates the solution to dryness. Thus prepared glycion is a yellow transparent mass, like amber, having the sweet taste of liquorice, soluble in alcohol and water; heated in the air it swells, kindles and burns. The powder burns like powdered rosin. From its watery solution it is precipitated gelatinous by all acids, and the compounds have a sweet taste, not at all acid. It unites readily with alkalies, and these compounds are also merely sweet, and it combines with many metallic oxides.

Trommsdorff carried the analysis of liquorice root still farther. He found in it a little fermentable sugar, and two sweet principles incapable of fermentation, one of which is insoluble in alcohol.

Med. use.—Its predominant constituents being saccharine and mucilaginous matter, its only action is that of a mild demulcent, and as such it is frequently used in catarrh, and in some stomach complaints, which seem to arise from a deficiency of the natural mucus which should defend the stomach against the acrimony of the food, and of the fluids secreted into it.

It is rarely exhibited in substance, but more frequently in infusion or decoction.

Off. Prep.—Decoctum glycyrrhizæ, *D.* Extractum glycyrrhizæ, *L. D.* Aqua calcis comp. *D.* Infusum lini comp. *L. D.* Decoct. guaiaci comp. *E. D.* Decoct. hordei comp. *L. D.* Decoct. mezerei comp. *E. D.* Decoct. sarsap. comp. *D. L.* Electuarium sennæ, *E. L.* Pilulæ hydrargyri, *D. L.* Tinct. rhei comp. *D. L.*

EXTRACT OF LIQUORICE. Spanish juice *.

As this extract is never prepared by the apothecary, but commonly imported from other countries, the Edinburgh College have inserted it in their list of materia medica. It is imported in cylindrical rolls, covered with bay leaves. It should be perfectly black, brittle when cold, and break with a smooth and glassy fracture, have a sweet taste, without empyreuma, and be almost entirely soluble in water. It is prepared from the fresh roots by expression, decoction, and inspissation.

The best foreign extract of liquorice is now prepared in Italy, and marked with the name of the maker, Solazzi; that from Spain is of inferior quality, and now scarcely marketable. The refined liquorice sold in the shops, in small cylindrical pieces, not thicker than a goose-quill, is a composition of inferior extract with mucilage or glue.

Neumann got from 480 parts of Spanish extract, 460 watery extract, and the residuum was not affected by alcohol. Dalk says alcohol takes up 1-8th of an acrid matter, and that the remainder is soluble in water, and perfectly sweet.

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* *Syn.* Extrait de réglisse, (*Fr.*) Süssholzsaft, (*Ger.*) Sugo di liquirizia, (*It.*)

Med. use.—Extract of liquorice is one of the most useful demulcents, especially in tickling coughs. Its sweetness is not so cloying to the stomach as that of sugar. It is used in pharmacy to cover the bitter taste of aloes, and to give form to some pill masses.

Off. Prep.—Trochisci glycyrrh. glab. *E.* Troch. glyc. cum opio, *E.* Pilulæ opiatæ, *E.* Pil. scilliticæ, *E.* Decoctum aloes comp. *D. L.* Tinctura aloes, *D. E. L.*

GRANATI CORTEX. *Lond.* See PUNICA.

GRATIOLA OFFICINALIS. *Ed.*

Willd. *g.* 49. *sp.* 1; Spr. *g.* 76. *sp.* 4. *Diandria Monogynia.*—Nat. ord. *Personatæ,* Juss.

Hedge-hyssop*.

Off.—The plant.

HERBA GRATIOLÆ OFFICINALIS. *Ed.*

THIS is a small perennial herb, a native of marshy situations in the south of Europe. It is gathered for use in June and July, when in flower. It has a quadrangular stem, sessile, lanceolate, serrated, smooth leaves, and ringent whitish flowers; no smell; but a very bitter, somewhat nauseous taste.

Vauquelin has analysed hedge-hyssop. Its expressed juice contains, in a state of solution, 1. A brown gummy matter; 2. A particular resinous matter extremely bitter; 3. A small quantity of animal matter; 4. Muriate of soda, and perhaps malate of potass. What remains, after expression, contains malate and phosphate of lime and iron, probably in the state of phosphate. M. Vauquelin thinks, that the active and purgative ingredient is the substance, soluble in alcohol, which he has called a resinoid, as it is the only one possessing taste. Its solubility in water, which is increased by the gum and salts, explains why the infusion, and still more the decoction, are drastic purgatives.

Med. use.—It is a drastic purgative and emetic, known to the ancients; but its use requires caution. In substance it may be given to the extent of half a drachm, and in infusion to three drachms. It has been given in worms, dropsy and mania. In this country it is not at all employed.

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* *Syn.* Gratiole, Herbe à pauvre homme, (*Fr.*) Wildaurin, Gottesgnadenkraut, (*Ger.*) Graziola, (*It.*)

GUAIACUM OFFICINALE. *Ed. Lond. Dub.*

Willd. *g.* 819, *sp.* 2; Spr. *g.* 1585, *sp.* 2. *Decandria Monogynia.*—Nat. ord. *Gruinales,* Linn., *Rutaceæ,* Juss.

Guaiac.

Off.—The wood and resin.

a) LIGNUM. *Ed. Lond. Dub.* *.

b) RESINA. *Ed. Lond. Dub.* †.

THIS tree is a native of the West Indies, and grows to a middling size. In 1508, the wood was first used in Spain for the cure of syphilis, under the title of *Legno santo* ‡. In 1517, its use was extended to Italy, and soon after 1518 to Germany, by Ulrich von Hutten.

The bark, although not officinal, is by far the most active part of this tree. It is heavy, hard, flat, some lines thick, externally rough and fissured, of a black green colour, with bluish green and yellow spots, internally yellowish grey, and clear brown in the fracture. It is easily divided into layers. Its taste is acrid, biting, and bitterish. When long kept, a number of small crystals are observed in its inner surface, which Guibourt takes to be benzoic acid. Neumann got from 3840 parts, 560 alcoholic, and 320 watery extract; and inversely, 620 watery, and 240 alcoholic.

The wood is heavier than water, sp. gr. 1.333, very hard, resinous, and of a greenish-black colour. It is found in the shops only in the state of raspings or shavings, which have a yellow colour, marked with greenish or bluish-green spots, and acquire a bluish green by exposure to the fumes of nitrous acid, which is a characteristic of their being genuine. Its taste is acrid, and when kindled it gives out a pleasant smell. It is imported either in pieces which are sometimes covered with a pale yellow alburnum, or already rasped, when by division its colour appears greenish brown, or yellow. Neumann got from 7680 parts of the wood, 1680 alcoholic, and 280 watery extract; and inversely 740 watery, and 960 alcoholic. As guaiac wood is used only in decoction, its virtues must depend upon principles soluble in water. Pfaff found the decoction yellowish, colour not affected by the air or nitrous acid, nor does it precipitate tannin or tartar-emetic, and it is rendered only a little darker by sul-

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[*] *Syn.* Gayac, (*Fr.*) Gemeiner Franzosenholz, (*Ger.*) Guaiaco, (*It.*)

[†] *Syn.* Gomme-resin de gayac, (*Fr.*) Guajakharz, (*Ger.*) Gommo-resina di guajaco, (*It.*)

[‡] It is said that the *legno santo* is the wood of another species also growing in the West Indies, the *G. sanctum.* It is of a pale yellow colour, lighter, and less efficacious than the officinal guaiac.

phate of iron. It impresses the fauces with a durable pricking sensation. Dr Geiger got 5 oz. 3 dr. of thick extract from 3 lb. avoirdupois of the wood.

The resin is sometimes the concrete juice, which has exuded spontaneously, or from incisions made into the tree; but it is principally obtained by sawing the wood into billets about three feet long, which are then bored with an augre longitudinally. One end of these is laid upon a fire, so that a calabash may receive the melted resin, which runs through the hole as the wood burns. It may be also obtained by boiling the chips or sawings of the wood in water and muriate of soda. The resin swims, and may be skimmed off.

Guaiac resin, or *guaiacine*, occurs in large amorphous, hard pieces, with bits of bark sometimes adhering to them. Their natural colour is reddish brown or hyacinthine; but from the action of the air, the surface is generally of a dark pistachio green, which enters into the cracks and fissures, and penetrates its substance more or less deeply, and is covered with a greenish powder; translucent; fracture shining, partly conchoidal, partly splintery; splinters transparent reddish brown, or yellowish green; brittle, easily friable; of a sweetish bitter, and afterwards of a durable acrimony, especially in the fauces; of a peculiar narcotic smell, chiefly developed when it is put on hot coals, in the vapour, which irritates the lungs. It does not soften by the heat of the hand, but becomes tough when chewed, and is fusible in a moderate heat, sp. gr. 1.20 to 1.23. Powder greyish white, becoming green from the action of the air.

Mr Brande of London has investigated its chemical properties. Digested with water, about one-tenth of it is dissolved, the water acquiring a sweetish taste and greenish-brown colour. The liquid, when evaporated, leaves a brown substance soluble in hot water and alcohol, but scarcely in sulphuric ether, and precipitating the muriates of alumina and tin. Buchner thinks this is derived from particles of the bark torn off with the resin. Alcohol readily forms with guaiac a deep brown-coloured solution, which is decomposed by water, and precipitated blue, green, or brown, by acids. It is also soluble in ether and alkaline leys and in sulphuric acid. Nitric acid converts it into oxalic acid. On being burnt it leaves a large proportion of charcoal. Dr Wollaston has discovered that it acquires a green colour by exposure to the most refrangible rays of the sun. In the least refrangible rays it is disoxidized, and the yellow colour is restored. It gives a blue colour to the gluten of wheat flour, and to vegetable matters containing gluten, to mucilage of gum arabic and to milk. It is sometimes adulterated with colophony or common resin; but the fraud is detected by the smell of turpentine emitted when thrown on live coals, and more certainly by making a saturated solution in alcohol, precipitating with water, and adding gradually caustic ley, which at first re-dissolves the precipitate, but on further addition the colophony separates in the form of soap, if any be present. This test by Thiemann I have verified.

Med. use.—Taken internally, guaiac, both wood and resin, commonly excites a sense of warmth in the stomach, a dryness of the mouth, with thirst. It increases the heat of the body, and quickens the circulation. If the patient be kept warm, it produces diaphoresis; if exposed freely to the air, an increased flow of urine. In large doses it is purgative.

Guaiac is a useful remedy, in rheumatism and gout; in certain venereal symptoms, as in foul indolent ulcers, and a thickened state of the ligaments or periosteum, remaining after the body is reduced by a mercurial course. Guaiac will also suspend the progress of some of the secondary symptoms. It is of use in some cutaneous diseases, in ozæna, and scrofulous affections of the membranes and ligaments.

The *wood* is always exhibited in decoction. It contains the acrid extractive.

The *resin* may be exhibited, 1*st*, in substance, made either into pills, or suspended in water in the form of an emulsion; in this way, from 10 to 30 grains of the resin may be taken in the day: 2*d*, dissolved in alcohol. About half an ounce of the tincture, with three ounces of water, is a sudorific dose for an adult, if he attend to keep himself warm. It is sometimes combined with an alkali.

Off. Prep. of the wood.—Aqua calcis comp. *D.* Decoctum guaiaci comp. *D. E.* Decoct. sarsaparillæ comp. *D. L.* *Of the resin.*—Tinctura guaiaci, *D. L. E.* Tinctura guaiaci ammoniata, *D. L. E.* Pulvis aloes comp. *D. L.* Pilulæ calomelanæ comp. *D. L. E.* Mistura guaiaci, *L.*

HÆMATOXYLON CAMPECHIANUM. *Ed. Dub. Lond.*

Willd. *g.* 830, *sp.* 10; Spr. *g.* 1601, *sp.* 1. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ*, Linn., *Leguminosæ*, sect. *Cassieæ*, Juss.

Logwood *.

Off.—The wood.

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* *Syn.* Bois de Campeche, Bois sanglante, (*Fr.*) Kampeschenholz, (*Ger.*) Legno di Campegio, (*It.*)

LIGNUM. *Lond. Dub. Ed.*

THIS tree was introduced from the Honduras into Jamaica, where it is now very common. The wood is firm, heavy, and of a dark red colour. It is imported in billets, which are afterwards cut into chips. Its taste is sweet, with a slight degree of astringency. It forms a precipitate with a solution of gelatine, very readily soluble in excess of gelatine, and with sulphate of iron it strikes a brighter blue than any other astringent I have tried. Its colouring principle was isolated by Chevreul, who, by the successive action of water and alcohol, obtained it in the form of crystals, and called it *Hæmatine.* It is reddish, crystallizable, bitter, soluble in water and alcohol; watery solution yellow when cold, orange-red when boiling; rendered purplish by alkalies, and reddish-yellow by sulphuric acid.

Med. use.—Logwood is used principally as a dye-wood, but also with considerable advantage in medicine. Its extract is sweet and slightly astringent, and is therefore useful in obstinate diarrhœas, and in chronic dysentery.

Off. Prep.—Extractum hæmatoxyli, *L. D.*

HELENIUM. *Lond.* See INULA.

HELLEBORUS.

Willd. *g.* 1089; Spr. *g.* 2040, *sp.* 3; Smith, *g.* 256. *Polyandria Polygynia.*—Nat. ord. *Multisiliquæ,* Linn., *Helleboraceæ,* Juss.

Sp. 2. Willd. HELLEBORUS NIGER. *Ed. Lond. Dub.*

Black hellebore. Christmas rose [*].

Off.—The root.

RADIX. *Ed. Lond. Dub.*

THIS plant, which was formerly called *Melampodium,* is perennial, and is indigenous in the mountainous regions of the south of Europe, as the Alps, Pyrenees and Apennines. The earliness of its flowers, which sometimes appear in December, has gained it a place in our gardens.

The roots consist of a black furrowed roundish head, (*rhizoma,*) about the size of a nutmeg, from which short articulated branches arise, sending out numerous descending radicles, very simple, smooth, brittle, about the thickness of a straw, from a span to a foot in length, deep brown on the outside, white or yellowish-white within, exhibiting 4–6 bundles of vessels disposed around the *medulla*, and of an acrid, nauseous and bitterish taste, exciting a sense of heat and numbness in the tongue, and of a nauseous acrid smell. These radicles only are used in medicine, and the head and branches are rejected. For the roots of the real black hellebore, those of some congenerous plants are occasionally substituted. The surest way to avoid mistakes is by the herbalist cultivating the plant in his own garden.

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[*] *Syn.* Ελλεβορος μελας, (*Dios.*) Hellebore noire, (*Fr.*) Schwartze Nieswurz, Christwurz, (*Ger.*) Elleboro negro, (*It.*)

Neumann got from 2880 grains 380 alcoholic and 181 watery extract; and inversely, 362 watery, and 181 alcoholic. Its active constituent seems to be of a volatile nature; for it loses its virtues by keeping, and water distilled from it has an acrid taste. It has been more recently examined by Feneuille and Capron, who found in it a volatile and a fixed oil, resin, wax, a volatile acid, bitter principle, mucus, alumine, super-gallate of lime, and of potass, and an ammoniacal salt.

Med. use.—In large doses hellebore root is a drastic purgative; in smaller doses, it is diuretic and emmenagogue. It has been used as a purgative in cases of mania, melancholy, coma, dropsy, worms and psora, and as an emmenagogue. But its use requires very great caution, for its effects are very uncertain, and affected by many circumstances.

It may be exhibited in the form of extract, although its activity be much dissipated by the preparation. An infusion and tincture certainly promise to be medicines of more uniform powers. Willdenow says, that the black hellebore of the ancients is his fifth species, the *Helleborus orientalis*, the *H. officinalis* of Salisbury and Sibthorp.

Off. Prep.—Tinctura hellebori nigri, *D. L. E.* Extract. helleb. nigri, *E.*

Sp. 6. Willd.; *sp.* 9. Spr.; *sp.* 2. Smith. HELLEBORUS FŒTIDUS. *Lond.*

Bears foot. Stinking hellebore. Settiswort.

Off.—The leaves.

FOLIA HELLEBORI FŒTIDI. *Lond.*

THIS species is a native of England. It is perennial, grows in shady places, and under hedges, and flowers in March and April. The leaves have an acrid, bitter, nauseous taste, and unpleasant smell, especially when they are fresh. When dried, they are sometimes given as a domestic medicine to destroy worms; but they must be used sparingly, being so violent in their operation, that instances of their fatal effects are recorded.

HERACLEUM GUMMIFERUM. *Dub.* See AMMONIACUM.

HIRUDO MEDICINALIS. *Dub.*

The leech.

Cl. Vermis. Ord. *Helmintheca.*

ONLY one species of leech is used in medicine. It has a flat and slimy body, composed of rings, tapering towards the head, which is turbinated, commonly about two or three inches long, and of the thickness of a goose-quill, but capable of elongating or contracting itself very much. Its back is of a dull olive-green colour, divided into three nearly equal parts by four yellow longitudinal lines, the two lateral entire, the two central broken with black. Besides these, between the lateral and central lines on each side, there are two others, resembling a chain of black and yellow. The belly is turkey blue, irregularly marked with yellow spots. It attaches itself to solid substances by either end, being furnished with a circular sucker at the anal extremity, and at the head with a horse-shoe sucker, having a triangular mouth in the centre.

Leeches should be collected in summer, in waters having a clear sandy bottom, as the bite of those found in stagnant waters and marshes is said to cause pain and inflammation. For the same reason, the horse-leech, which is entirely brown, or only marked with a marginal yellow line, is commonly rejected, although they are used frequently in the North of Europe, and during the late scarcity of leeches have occasionally been employed, without any bad consequences, in this country.

Leeches are best preserved for use in a bottle half filled with pure spring or river water, and covered with gauze or muslin. It is advisable frequently to change the water in which they are kept, although they may live many months, and even years, in the same water; and it is remarkable that water, in which they are, keeps much longer sweet than by itself. It is scarcely necessary to observe, that whenever the water becomes turbid, or foul, or gets an unpleasant smell, or any of the leeches dies in it, it should be changed. They should always be kept in a moderate temperature, about 50° Fahr. Some recommend throwing a little bran into the water; but it is so well ascertained that they will live for years without any such addition, that it is better not to attempt to feed them, until we are better acquainted with their natural food. Though apparently so hardy, leeches are sometimes subject to great mortality, from unknown causes, as in 1798 and 1799. Infection in some cases seems evident. To avoid danger from this source, they should be kept in several vessels, rather than in one large reservoir; and when fresh leeches are procured, they should always be kept by themselves, and their health ascertained, before they are added to the general stock. When they have gorged themselves with blood, they frequently die of indigestion, and cause a great mortality even among those which have not been used. To avoid this danger, leeches, which have recently sucked, should also be kept by themselves, until they have recovered their usual vigour. The treatment of the individuals which have performed their office has been the subject of some controversy. One recommends using no means to make them disgorge the blood they have sucked, but only to immerse them for half an hour in milk-warm water, and to change the water in which they are kept regularly every second day for some time; others advise stripping them, as it is called, that is, taking hold of the tail between the finger and thumb of the left hand, and drawing the animal through those of the right, so as to evacuate the blood; while others, again, apply salt to their heads, until they vomit all the blood they have sucked. Leeches change their skin frequently. At that time they are subject to indisposition. The removal of the old cuticle may sometimes be assisted by wiping them with a bit of soft linen.

Med. use.—Leeches are a very old and useful remedy in every case requiring local blood-letting.

The application of leeches is sometimes attended with difficulty. When changing their skin, they will not bite, and are averse to it in cloudy rainy weather, and in the evening. When kept out of the water some minutes before they are applied, and allowed to crawl on dry linen, they are said to bite more eagerly. The part to which they are to be applied should be very well washed, first with soap and water, and afterwards with water, or milk and water, and if covered with strong hairs, it should be shaved. When they are not inclined to bite, the part may be moistened with milk, or a little blood drawn from it by a scratch with a lancet. When they fix, they inflict, without causing much pain, a wound of three minute flaps, meeting at equal angles, from which they suck blood until they are gorged, and drop off spontaneously, or are forced to quit their hold by sprinkling on them a little salt. A large leech will draw about an ounce of blood; but the quantity may be much increased by bathing the wounds with tepid water, or applying over them large poultices of bread and mild, or cupping glasses. Sometimes it is even difficult to stop the bleeding; but it will always cease on applying a little lint, and continuing pressure a sufficient length of time, and more easily by touching the wound with lunar caustic.

HORDEUM DISTICHON. *Ed. Dub. Lond.*

Willd. *g.* 151, *sp.* 3; Spr. *g.* 278, *sp.* 6. *Triandria Digynia.*—Nat. ord. *Gramina,* Linn. Juss.

Barley [*].

Off.—The decorticated seed, called Pearl-barley.

SEMINA. Semina decorticata. *Dub. Ed. Lond.*

BARLEY is an annual plant, cultivated in almost every part of Europe. The native country of barley is uncertain. It has been said to be Tartary, Central Russia, Georgia, Northern India, and Sicily.

Pearl-barley [†] is prepared by grinding off the husk of rough barley, and forming the grain into little round granules, of a pearly whiteness.

Barley meal consists of the decorticated seed ground into a coarse flour. It has a greyish white colour, a peculiar mawkish smell, and a mucilaginous taste.

Malt [‡] is the entire seed, which has been made to germinate by watering it and then killed by drying it in a kiln. It should be externally pale brown, compact but friable, white and mealy in its fracture; of an agreeable, somewhat pungent smell, not smoky, and of a pleasant sweet taste.

Barley meal, according to Fourcroy and Vauquelin, contains starch, sugar, a little unctuous coagulable oil, an animal substance partly soluble in water, and partly forming glutinous flocculi; phosphate of lime and magnesia, silica, iron, and a little acetic acid.

Proust has published a comparative analysis of raw and malted barley. He found in

	Resin.	Gum.	Sugar.	Gluten.	Starch.	Hordeine.
Barley,	—1	4	5	3	32	55=100
Malt,	—1	15	15	1	56	12=100

It therefore appears, that by the process of germination, gum, sugar and starch, are formed at the expense of hordeine, a principle discovered in barley by Proust. It is obtained in the same way and along with the starch, which is removed by decoction with water, while the hordeine remains undissolved. It thus has great analogy with lignine, and is considered by Raspail to be nothing but the powder of the husk, which, considering its quantity, is not probable, although there is none of it found in pearl-barley. Einhoff has also analysed barley, in various states of maturity. He got from ripe barley, flour, 70.05; husk, 18.75; and water, 11.2. The flour consisted of uncrystallizable sugar, 5.21; gum, 4.62; starch, 67.18; starch, gluten and fibres, 7.29; gluten, 3.52; albumen, 1.15; phosphate of lime with albumen, 0.24, and water, 9.37.

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[*] *Syn.* Κριθη λεύκη, (*Gr.*) Orge, (*Fr.*) Gerste, (*Ger.*) Orzo, (*It*)

[†] *Syn.* Hordeum perlatum, (*Off.*) Orge mondé, (*Fr.*) Gerstengraupe, (*Ger.*) Orzo perlato, Orzo di Germania, (*It.*)

[‡] *Syn.* Maltum, (*Off.*) Malt, (*Fr.*) Gerstenmalz, (*Ger.*) Grano tosto, (*It.*)

Med. use.—Barley is one of our most valuable grains, and is used in many ways. Entire, it is given as food to horses; and pearl-barley and barley meal are used by man, especially in northern countries. The former is eaten boiled until it is soft, either simply with some condiment, as salt, sugar, currants, cinnamon, or made into broth with meat, either alone, or with other vegetables. The flour is used in the form of porridge and unleavened cakes. It cannot be made into bread, and is incapable of the panary fermentation, which is owing to the small proportion of gluten in its composition. It is probably for the same reason that it is less nutritious. On the other hand, it has the advantage of having no tendency to induce constipation, so that some persons who are habitually costive derive great advantage from the use of barley meal cakes and porridge. Hufeland highly praises what he calls prepared barley meal as a nutritious food, easy of digestion, and devoid of all stimulus, in atrophic diseases and hectic fever. It is prepared by tying barley meal up in a cloth, and boiling it till every thing soluble is removed. On the contrary, it is the soluble part which is made use of in the *decoct. hordei*, or barley water.

Malt, on account of the quantity of sugar and gum which it contains, is more soluble in water than barley is. It is used as a demulcent and as a nutriment in atrophic and hectic diseases, either in the form of a decoction, or an extract. The former is prepared by boiling 2—4 oz. of malt in a quart of water, and straining the decoction, which may be used freely, or employed as the recipient of more active adjuncts, as acids, wine, or opiates. Wort, which is a decoction of malt with hop, is also used as a tonic demulcent in cases of debility and atrophy, and especially when there is internal suppuration, as of the liver, kidneys, or bladder; and in rheumatism or arthritic palsies. Wort readily undergoes the vinous fermentation, and forms beer, ale, or porter, according to its strength and management. Small beer, when well brewed, and impregnated with a sufficient quantity of carbonic acid gas, is a most grateful beverage in most febrile diseases, and may be safely allowed. Porter, in convalescence from fever, is often more adapted than wine for hospital practice. Ale is more heavy and nutritious, and allowed in a few cases only. The best British spirits are distilled from malt, although raw barley yields a larger product.

Off. Prep.—Decoctum hordei, *L. E. D.* Decoct. hordei comp. *L.*

HUMULUS LUPULUS. *Lond. Dub.*

Willd. *g.* 1795, *sp.* 415; Spr. *g.* 2177, *sp.* 1; Smith, *g.* 415, *sp.* 1. *Diœcia Pentandria.*—Nat. ord. *Scabridæ,* Linn., *Urticeæ,* Juss.

Hop [*].

Off.—The strobiles dried.

STROBILI HUMULI. Strobili siccati. *Lond. Dub.*

The hop is an indigenous climbing plant, with a perennial root, cultivated to a great extent in Kent, and some other counties in England, for its leafy *strobili,* which are used in the brewing of ale and porter; and as a very considerable revenue arises from the duty imposed on them, the use of all other bitters, such as quassia, &c. is prohibited by act of Parliament; as, indeed, hops themselves once were. In the north of Europe, the young shoots are eaten instead of asparagus.

Hops are the foliaceous cones of the female plant. They are long-ovoid, formed of thin persistent scales, of a pale greenish yellow colour, inclosing within their base two seeds, akenes, surrounded with a yellow granular powder. They have a heavy aromatic smell, and an intensely bitter taste, with astringency. No very accurate analysis has been made of the entire hop. By simple infusion the aroma is extracted; by short boiling the bitter, and by long continued boiling, the aroma is dissipated, and the astringency predominates. The aroma resides in a volatile oil, and the astringency in a species of tannin, for sulphate of iron is blackened by it. It also contains a resin from which it has bitterness, and a nauseous mucilaginous extractive, which alcohol precipitates from the infusion. Crystals of nitrate and muriate of potash appear in a long kept extract.

Sir J. E. Smith first observed, that the essential properties of the hop reside in a secreted substance which lies on the outside of the scales of the corolla and calyx, near their base.

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[*] *Syn.* Houblon, (*Fr.*) Hopfen, (*Ger.*) Lupulo, (*It.*)

This has since been confirmed by M. Planche, Dr Ives, and MM. Payen and Chevallier. The *Lupuline* of Dr Ives is got by rubbing the hop well dried upon a tamis sieve. The scales in general remain behind, and a fine yellow powder passes through, from which some of the fine particles of the scales may be blown away, but not all. This yellow powder is not an immediate principle like morphia, quinia, or strychnia, but an organic secretion like the gum-resins, and consists of a combination of principles. According to the analysis of Dr Ives, it consists of tannin, 5; extractive, 10; bitter principle, 10; wax, 12; resin, 36; and fibre, 46=100. MM. Payen and Chevallier have given a more minute analysis. In 100 parts they got 52.5 of a resin possessing peculiar properties; 12.5 of a bitter principle; 4 of silica. It contained also volatile oil, and a variety of other principles of little importance.

Med. use.—The old writers say, that hops were added to malt liquors on account of the lithontriptic virtues which they were supposed to communicate. Their evident effects are to impart an aromatic bitter, and to retard the acetous fermentation; for malt liquors keep longer in proportion to the quantity of hops added. The bitterness decreases as the liquor becomes ripe, and disappears as it verges to acidity. Bergius supposes that the sweetness of the malt would hurt the stomach, were it not corrected by the bitterness of the hop. It also probably communicates a narcotic quality. A pillow stuffed with hops is said to have long been a popular hypnotic, and later experiments have confirmed the fact, and led to the employment of various preparations of hops in medicine. The dose of the powder of the entire hop, is about three grains, although it may be remarked that it is very difficult to powder. It produced sleep, in the experiments of Dr De Roches, in rheumatic, syphilitic, and pectoral complaints. The tincture seemed to possess the same anodyne virtues, but it was not so uniform in its action. Dr Maton gave it in the form of tincture and extract, with the best effect, in articular rheumatism. He did not observe that it had any influence in relaxing the bowels, but the contrary; and he is disposed to believe that the pulse is reduced in frequency, and increased in firmness, by this medicine, in a very direct manner. An ointment compounded with the hop is said, by Mr Freake, to have eased the violent pain in the last stage of cancer, when all other applications were ineffectual.

As containing the virtues of the hop, concentrated in a small volume, Lupuline is deserving of a trial as a medicinal agent. M. Planche thinks that the most appropriate form for its administration is that of pill. Dr L. Frank recommends it in the form of ointment in the last stage of cancer, when the pains are very intense, and other means have proved without success. The following is the formula preferred by M. Planche for that ointment: Take of lupuline bruised one part; fresh lard three parts. Heat them by a water-bath in a close vessel for six hours; strain; allow it cool; scrape off any sediment; liquefy it anew, and pour it off. This ointment when cold has a fine yellow colour, and perfectly retains the smell of hop.

Off. Prep.—Tinctura humuli, *D. L.* Extractum humuli, *D. L.*

HYDRARGYRUM. *Dub. Lond.* HYDRARGYRUS. *Ed.*

Mercury. Quicksilver *.

MERCURY is a very bright white fluid; specific gravity 13.568; freezing at —39°; boiling at 660°; when frozen, ductile and malleable; oxidizable by trituration in the air, and in a farther degree by the action of the air and heat; does not decompose water; forms amalgams with many metals; and is oxidized and dissolved by the sulphuric, nitric and oxymuriatic acids. Protoxide black, peroxide red.

It is found in its metallic state; *a.* uncombined, native mercury; *b.* alloyed with silver; *c.* combined with sulphur, (cinnabar); *d.* combined with carburetted sulphur; *e.* combined with muriatic acid, corneous mercury.

There are considerable mines of mercury in Hungary and in Spain. What is employed in England is principally imported from the former country.

Med. use.—Mercury, taken into the stomach in its metallic state, has no action on the body, except what arises from its weight or bulk. It is not poisonous, as vulgarly supposed, but perfectly inert; on the contrary, in its various states of combination, it produces decided sensible effects. It quickens the circulation, and increases all the secretions and excretions. According to circumstances, the habit of the body of the patient, the temperature in which he is kept, the nature of the preparation, and the quantity in which it is exhibited, its effects are indeed various; it sometimes increases one secretion more particularly, sometimes another; but its most characteristic effect is the increased flow of saliva which it generally excites, if given in sufficient quantity.

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* *Syn.* Mercurius, Argentum vivum, (*Off.*) Mercure, (*Fr.*) Quecksilber, (*Ger.*) Mercurio, (*It.*) Rasam, (*Tam. Tel.*) Pārāh, (*Duk. Hind.*) Abuk, Zibākh, (*Arab.*) Seemāb, (*Pers.*) Pará, (*Hindooic.*) Rassa, (*Mal.*) Sutam, Rasa, Pārada, (*Sans.*) Shwuy-yin, (*Chin.*)

Mercury, or some of its preparations, is exhibited,

1. As an errhine. The sub-sulphate of mercury.
2. As a sialogogue. Mercury, in almost any form.
3. As a cathartic. Calomel.
4. As a diuretic. The oxides, the muriate, and the sub-muriate, combined with other diuretics.
5. As a sudorific. Calomel, conjoined with opium, and a sudorific regimen.
6. As an emmenagogue.
7. As an astringent. Muriate of mercury.
8. As a stimulant. Muriate of mercury.
9. As an anthelmintic.

With some of these views, mercury is frequently exhibited,

1. In febrile diseases; in continued fevers and obstinate agues.
2. In inflammatory diseases; in indolent and chronic inflammations, especially of the glandular viscera, as the liver, spleen, &c.
3. In exanthematous diseases; variola.
4. In profluvia; in dysentery.
5. In spasmodic diseases; tetanus, trismus, hydrophobia, &c.
6. In cachectic diseases; anasarca, ascites, hydrothorax, hydrocephalus, &c.
7. In impetigines; scrofula, syphilis, lepra, icterus, &c.
8. In local diseases; in caligo corneæ, amaurosis, gonorrhœa, obstipatio, amenorrhœa suppressionis, tumours of various kinds, herpes, tinea, psora, &c.

Mercury occasionally attacks the bowels, and causes violent purging, even of blood. The effect is remedied by intermitting the use of the medicine, and by exhibiting opium.

At other times it is suddenly determined to the mouth, and produces inflammation, ulceration, and an excessive flow of saliva. In this case, too, the use of the mercury must be discontinued for a time; and, according to Mr Pearson's advice, the patient should be freely exposed to a dry cold air, with the occasional use of cathartics, Peruvian bark, and mineral acids, and the assiduous application of astringent gargles. On the other hand, the sudden suppression of ptyalism is not without danger. It is most frequently caused by cold liquids being taken into the stomach, or by exposure to cold and moisture, while under the influence of mercury. The danger is to be obviated by the quick introduction of more mercury, so as to affect the gums, with the occasional use of the warm bath.

Sometimes also a morbid condition of the system occurs during a mercurial course, and tends to a fatal issue. Mr Pearson has termed it Erethismus. It is characterised by great depression of strength; a sense of anxiety about the præcordia; frequent sighing; trembling, partial or universal; a small quick pulse; sometimes vomiting; a pale contracted countenance, a sense of coldness, while the tongue is seldom furred, or the vital or natural functions much disordered. In this state, a sudden or violent exertion of muscular power will sometimes prove fatal. To prevent dangerous consequences, the mercury must be discontinued, whatever may be the stage, extent, or violence of the disease for which it has been exhibited, and the patient must expose himself freely to a dry and cool air, in such a manner as shall be attended with the least fatigue; and in the course of ten or fourteen days, he will sometimes be so far recovered, that he may safely resume the use of mercury.

In some particular habits it also produces an exanthematous disease, which sometimes proves fatal, and is now well known by the names of *erythema* or *eczema mercuriale.*

From many motives, both laudable and culpable, mercury has been tortured into a greater variety of forms than any other article of the materia medica. I subjoin a systematic view of those mercurial preparations only which enter at least into one of the British Pharmacopœias.

Mercury is exhibited,

I. Metallic.
  a. Purified by distillation.
    Hydrargyrum purificatum. *D. L.*
    Hydrargyrus purificatus. *E.*
  b. Combined with sulphur.
    1. By trituration,
      Hydrargyri sulphuretum nigrum. *E. D.*
    2. By sublimation,
      Hydrargyri sulphuretum rubrum. *L. D.*
  c. With one proportion of chlorine.
    1. By sublimation,
      Hydrargyri sub-murias. *L.*
      Sub-murias hydrargyri *mitis* sive *Calomelas.* *E.*
      Calomelas sublimatum. *D.*
        Pilulæ hydrargyri sub-muriatis. *L. E.*
    2. By precipitation.
      Sub-murias hydrargyri præcipitatus. *E.*
      Calomelas præcipitatum. *D.*
  d. With two proportions of chlorine.
    Murias hydrargyri corrosivus. *E.*
    ———————— corrosivum. *D.*
    Hydrargyri oxymurias. *L.*

e. With cyanogen.
  Hydrargyri cyanuretum. *D.*

II. Oxidized.
  A. Protoxide.
    1. By precipitation, from its solution in nitrous acid, by ammonia.
      Hydrargyri oxidum cinereum. *E. L.*
        Unguentum oxidi hydrargyri cinerei. *E.*
    2. By precipitation, by *aqua potassæ.*
        Hydrargyri oxydum nigrum. *D.*
    3. By trituration.
      a. With unctuous substances.
        Unguentum hydrargyri. *E. D.*
        ——————— fortius. *L.*
        ——————— mitius. *L. D.*
        Linimentum hydrargyri. *L.*
        Emplastrum ammoniaci cum hydrargyro. *L. D.*
        Hydrargyri emplastrum. *E. L.*
      b. With saccharine substances.
        Hydrargyri pilulæ. *L. D. E.*
      c. With carbonate of lime,
        Hydrargyrum cum creta. *L. D.*
      d. With carbonate of magnesia,
        Hydrargyrum cum magnesia. *D.*
  B. Peroxide.
    1. By the action of heat and air.
      Hydrargyri oxydum rubrum. *D. L.*
    2. By the action of nitrous acid,
      Oxydum hydrargyri rubrum *per acidum nitricum.* *E.*
      Hydrargyri oxydum nitricum. *D.*
      Nitrico-oxydum hydrargyri. *L.*
        Unguentum oxidi hydrargyri rubri. *E.*
        ——————— hydrargyri oxydi nitrici. *D.*
        ——————— hydrargyri nitrico-oxydi. *L.*

III. Oxidized and combined with acids;
  A. Protoxide.
    1. With nitric acid:
      a. Unguentum hydrargyri nitratis. *L. D.*
        ——————— nitratis hydrargyri fortius, *vulgo* Unguentum citrinum. *E.*
      b. Unguentum nitratis hydrargyri mitius. *E.*
    2. With acetic acid:
        Acetas hydrargyri. *E. D.*
  B. Peroxide.
    1. With muriatic acid,
      Liquor hydrargyri oxymuriatis. *L.*
    2. Submuriate with ammonia,
      Hydrargyri submurias ammoniatum. *D.*
          Hydrargyrum præcipitatum album. *L.*
            Unguentum hydrargyri sub-muriatis ammoniati. *D.*
            Unguentum hydrargyri præcipitati albi. *L.*

3. With sulphuric acid,
   Hydrargyri persulphas, *D.*
   Sub-sulphas hydrargyri flavus. *E.*
   Hydrargyri oxydum sulphuricum. *D.*

HYOSCYAMUS NIGER. *Ed. Lond. Dub.*

Willd. *g.* 378, *sp.* 1; Spr. *g.* 650, *sp.* 4; Smith, *g.* 99. *sp.* *Pentandria Monogynia.*—Nat. ord. *Solaneæ*, Linn. Juss.

Common henbane[*].

Off.—The herb and seeds.

a.) HERBA. *Ed. Dub.* FOLIA. *Lond.*

b.) SEMINA. *Ed. Lond.*

HENBANE is an annual plant, which grows in great abundance in most parts of Britain, by the road sides, and among rubbish, and flowers in July. Stem about 18 inches high; cylindrical, thick, branchy, leafy and downy; leaves alternate, large, sessile, amplexicaule, oblong-ovate, dentato-sinuated, segments pointed, entire, soft and velvety, of a greyish green colour, brighter on the lower surface, with scattered oily hairs, and veined. Its smell is strong and peculiar, and, when bruised, something like tobacco, especially when the leaves are burnt; and on burning, they sparkle, as if they contained a nitrate: when chewed, however, they have no saline taste, but are insipid, mild, and mucilaginous. The herb should be collected before its inflorescence, and kept among the poisons.

Roots; fusiform, white, poisonous.

Seeds; small, numerous, cinereous, oval, obtuse, compressed.

The herb has been analyzed by Lindbergsen, who found a narcotic principle; an extractive soluble in alcohol, which was not narcotic; malic, phosphoric, sulphuric and muriatic acids, with potass and some magnesia.

A very complex analysis of the seeds has been made by Brandes, who got of fixed oil, easily soluble in alcohol, 196; of fixed oil, difficultly soluble in alcohol, 460; peculiar substance like stearine, or rather wax, 9.5; wax, 14; half resin, 36; animo-vegetable matter, 34; albumen, 8; indurated albumen, 37.5; malate of hysociamine, with traces of malates of lime, magnesia, potass and ammonia, 63; sulphate, malate and muriate of potass, 4; malate of lime, 4; malate of magnesia, 2; phosphate of lime and magnesia, 24; gum, 12; bassorine, 24; amylum, 15; mucous sugar, a trace; fibres, 260; water, 240 = 1025. The ashes contained carbonate, phosphate, muriate and sulphate of potass; much phosphate of lime, and silica; sulphate of lime, oxide of iron, of manganese, and of copper a trace.

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[*] *Syn.* ʽΥοσκυαμος μελας, (*Dios.*) Jusquiame noir, (*Fr,*) Schwartzes Bilsenkraut, (*Ger.*) Jusquiamo, (*It.*) Kōrásánie ōmum, (*Tam.*) Buzirulbunj, Urmanikoon, Sikrān, (*Arab.*) Adas, (*Jav.*) Adas-pedas, (*Mal.*) Korassanie, (*Cyn.*) Khorasannie ajovan, (*Duk. Hind.*)

Lindbergsen obtained the narcotic principle by means of subacetate of lead, according to Runge's method. It could not be made perfectly dry; had an acrid saline taste; was perfectly soluble in water; had slight alkaline reaction, and caused great dilatation of the pupil. He thinks, however, that its alkaline properties depended upon its not being perfectly freed from potass.

Med. use.—From the writings of Dioscorides and others, it appears, that different species of henbane have been long used in the practice of medicine. By Celsus it was applied externally as a collyrium in ophthalmia; and for allaying the pain of the toothach; and he gave it internally as an anodyne.

Its use, however, was for a long period entirely relinquished, until revived by Dr Störck of Vienna, in those cases where an anodyne is requisite, and where there are objections to the use of opium; and it is now very much employed.

In a moderate dose it generally produces sound sleep, succeeded by serenity of mind, and recruited vigour of the body; but like the other narcotics, instead of these, it sometimes gives rise to vertigo, headach, and general uneasiness. With particular individuals, it occasions vomiting, colic pains, a copious flow of urine, and sometimes purging. In excessive doses it is capable of producing fatal effects, preceded by general debility, delirium, remarkable dilatation of the pupils of the eyes, and convulsions. Upon the whole, like opium, it is a powerful anodyne; and, like cicuta, it is free from any constipating effect, having rather a tendency to move the belly. It may be given, in the form of powder, in doses of five or ten grains. More commonly the tincture is administered to the extent of one or two drachms.

An extract from the leaves, or from the seeds, has been used with advantage in a variety of nervous affections, as mania, melancholia, epilepsy, hysteria, trismus, and spasms from injured nerves, in rheumatism and arthritis, in glandular swellings, in obstinate ulcerations, and in every case where it is desirable either to allay inordinate action, or to mitigate pain. Its dose may be gradually increased from half a grain. Collin pushed it to the length of 36 grains a dose, and Fouquier still farther.

Externally it is employed in wandering rheumatic pains, in indurations of the mammæ from retained milk, painful swellings, whether scirrhous or not, scrofulous and cancerous ulcers, inflamed piles, and spasms of the bowels from increased irritability; under the form of a cataplasm of the bruised leaves, with bread and milk; of an ointment, made of the powder of the leaves, with wax and oil; of a simple powder, sprinkled on the sore, or of a decoction in milk as an injection. An infusion prepared by digesting the bruised leaves in olive oil is also usefully applied in inflammation of the bowels, kidneys, testicles, urethra, painful retention of urine, and in blind piles.

It is also applied in the form of a pessary to dilate the *sphincter ani*, to facilitate the operation for fistula; to the *os tincæ*, to relax the mouth of the womb, and injected into the urethra against spasms of the neck of the bladder, and in chordee. It has also been lately much used by oculists for dilating the pupils of the eyes in order to facilitate the extraction or breaking down of the cataract, to diminish sensibility, to destroy adhesions, to reduce protrusions of the iris, and to dilate contraction of the pupil. The mode of application is by dropping a few drops of solution of the extract into the eye, or applying them with a camel's hair brush. The greatest effect is produced in about four hours, and it is generally over in twelve. Vision is not impaired during its action. For this purpose, Dr Reisinger prefers hyosciamine, as possessing the anodyne, without the irritant effects of the extract. One grain dissolved in a drachm of water is sufficiently strong.

Off. Prep.—Succus spissatus hyosciami, *E. D.* Extractum hyosciami, *L.* Tinctura hyosciami, *L. E. D.*

HYSSOPUS OFFICINALIS. *Ed.*

Willd. *g.* 1096, *sp.* 1; Spr. *g.* 2088, *sp.* 1. *Didynamia Gymnospermia.*—Nat. ord. *Verticillatæ,* Linn., *Labiatæ,* Juss.

Hyssop[*].

Off.—The herb and leaves.

HERBA HYSSOPI OFFICINALIS. *Ed.*

HYSSOP is a perennial herb which grows wild in Germany. Its leaves have an aromatic smell, and warm pungent taste. Its virtues depend entirely on an essential oil which rises in distillation both with water and with alcohol. Besides the general virtues of aromatics, its preparations were formerly recommended in chronic catarrh, coughs, and other disorders of the breast and lungs, and were said to promote expectoration. It is chiefly used in the form of infusion or tea.

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[*] *Syn.* Hysope, (*Fr.*) Ysopkraut, (*Ger.*) Issope, (*It.*) Zufaiy yeabus, (*Arab.*)

JALAPÆ RADIX. *Lond. Dub.* See CONVOLVULUS.

INULA HELENIUM. *Dub. Lond.*

Willd. *g.* 1489, *sp.* 1; Spr. *g.* 2761, *sp.* 29; Smith, *g.* 369, *sp.* 1. *Syngenesia superflua.*—Nat. ord. *Compositæ radiatæ,* Linn., *Synantheræ,* sect. *Corymbiferæ,* Juss.

Elecampane *.

Off.—The root.

Radix. *Dub. Lond.*

THIS is a very large downy perennial plant, sometimes found wild in moist rich soils. It flowers in July and August. The root, especially when dry, has an agreeable aromatic smell: its taste, on first chewing, is glutinous, and, as it were, somewhat rancid; in a little time an aromatic bitterness is perceived, which by degrees becomes considerably acrid and pungent.

Neumann got from 480 grains of the dry root, 390 watery, and 5 alcoholic extract; and inversely, 150 alcoholic, and 300 watery. In distillation, alcohol elevated nothing; but the distilled water was first observed by Geoffroy to be milky, and mixed with flocculi of a cineritious concrete fusible volatile oil, partly swimming and partly sinking in the water, which he compares to camphor or benzoic acid.

According to Funke's analysis, elecampane root contains, 1. A crystallizable volatile oil; 2. A peculiar fecula; 3. An extractive matter; 4. Free acetic acid; 5. A crystallizable resin; 6. Albumen; 7. Fibrous matter. The ashes contain carbonates of lime and of magnesia, silica, and a trace of iron. This root has also been discovered by Rose to contain a matter having some analogy with starch, called *Inuline.* It is a white powder, insoluble in cold, but readily soluble in hot water; insoluble in alcohol; burns with the smell of caromel, and yields oxalic acid when treated with nitric acid. Inuline differs from starch, chiefly, in not acquiring a blue colour from iodine, and in being less altered by its solution in boiling water. It has been found in several roots, chiefly, if not solely, of the family of *Syngenesiæ.*

Med. use.—It is a gently stimulating medicine, nearly similar in its action to angelica. The extract is merely a slight bitter, as the essential oil is totally dissipated in the preparation.

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* *Syn.* Ελενιον (*Dios.*) Enula campana, (*Off.*) Inule aunée, Aunée, (*Fr.*) Alant, (*Ger.*) Enula, Elenio, (*It.*)

Off. Prep.—Confectio piperis nigri, *D. L.*

Iodinium. *Dub.*

Iodine *.

Iodine is a simple non-metallic uninflammable substance, having a great analogy with chlorine. It was discovered in 1812, in the ashes of sea-weed, by M. Curtois, and its nature was soon after ascertained by Sir H. Davy and Gay-Lussac. It is a soft friable solid, of a bluish black colour and metallic lustre. It occurs in crystalline scales, or in large rhomboidal plates. Sp. gr. 3.085, according to Dr Thomson; 4.948 Gay-Lussac. It melts at 225° F. and boils at 347; but wastes in ordinary temperatures, and rises with water in a state of ebullition. Its vapour has a violet colour, and is exceedingly heavy, 100 cubic inches weighing 262.612 grains. It is a non-conductor of electricity, and negatively electric. Taste very acrid; smell like dilute chlorine; it is soluble in 7000 times its weight of water, which acquires a light brown colour from it. It is much more soluble in alcohol and in ether, forming very deep brown solutions. It unites readily with metals, but not with their oxides. When added to a solution of caustic alkali it decomposes a part of the water, forming with the hydrogen and oxygen, hydriodic and iodic acids, which unite with the alkali. It gives a blue colour to a cold solution of starch, and thus serves as a very delicate test of its presence.

It is procured from the mother water remaining after the preparation of carbonate of soda from kelp. This is put into large retorts; concentrated sulphuric acid is added to decompose the hydriodate present and to set the iodine at liberty, and by the application of heat it is distilled over and condensed in the receiver, which must be kept cold. For pharmaceutical use, the iodine of commerce may be purified by introducing it into a tubulated retort with a very little water, and a five hundredth part its weight of potass. The retort is connected with the receiver by an adopter, and is heated in a sand bath, while the receiver is kept cold by a fine stream of water. When the whole iodine has come over, the apparatus is allowed to cool, and the product is dried by compression in bibulous paper. It must be kept in glass stoppered bottles, as it corrodes cork. On account of its high price it is liable to adulteration with the black oxide of manganese, plumbago, and charcoal. These frauds may be detected by alcohol, which leaves them undissolved, and by heat, which is unable to volatilize them. The only sources of iodine hitherto discovered are marine vegetables, especially the *fuci*, and sponges.

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* *Syn.* Iode, (*Fr.*) Iod, (*Ger.*) Iodina, (*It.*)

Med. use.—Iodine laid upon the skin has no escharotic action upon it, but stains it of a bright orange colour, which gradually disappears without desquamation. Taken internally it acts as a local irritant, though not very powerfully, and produces constitutional effects, having some resemblance to those of mercury. In medicinal doses it does not produce vomiting, purging, or sweat. It seems, however, to excite the genital organs. It promotes absorption; but if given in excess, or continued too long, it produces vascular fever, and lessens absorption, giving rise to general dropsy. It also acts deleteriously upon the nervous system; therefore its use must be suspended if it produce frequent quick pulse; a feeling of burning and heat in the gullet; pain in the orbits; bad colour of the face; inflammation and swelling of the gums; palpitation, restlessness, drowsiness, swelling and pain in morbid parts, and excessive voracity. If after this warning it be continued, there supervene rapid emaciation, palpitation, trembling of the limbs and death. Against this erethism, the best treatment is by general and local bleeding, warm baths, milk, bland low diet, and rest. The hydrocyanic acid is also said to counteract the nervous symptoms.

Med. use.—Iodine was introduced as a medicine for the cure of the goitre by Dr Coindet of Geneva. He was led to its employment by chemical analogy, from the popular remedies against this affection containing iodine. The general result from multiplied experience is, that in a great majority of cases, the swelling of the thyroid gland is reduced and removed by a prudent use of this remedy.

It has also been recommended as an emmenagogue in diseased ovary; in enlargement of the mammæ, and in obstinate leucorrhœa; also in strumous glands, tuberculous phthisis, in white swelling of the knee, and in gonorrhœa.

It is used in the form of tincture, of hydriodate of potass, and of ointment. Dr Murray of Belfast has recently recommended the inhalation of its vapour in tuberculous phthisis.

Off. Prep.—Iodinii tinctura, *D.* Unguentum iodinii, *D.* Potassæ hydriodas, *D.*

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[*] *Syn.* Poaya, Poaya do mato, Poaya da botica, (*Braz.*) Ipecacuanha gris (*Fr.*) Graue Ipecacuan, (*Ger.*) Ipecacuana grigea, (*It.*)

IPECACUANHÆ RADIX. *Ed.* *Callicocca Ipecacuanha.* Brotero, Transactions of the Linnæan Society. *Lond.* *Cephaëlis Ipecacuanha.* Richard, *Dub.*

IT has been commonly stated that Ipecacuan *, in the language of South America, means vomiting root. This, it appears, is a mistake. It is known among the Indians only by the name of *Poaya*, which is given to all emetic roots. The Portuguese call it *Cipo*; and according to St Hilaire ipecacuan is derived from the Indian words, *Ipe*, bark, *cao*, plant, *cua*, smelling, *nha*, radiated.

1. The common brown ipecacuan grows in Brazil, and is exported from Rio Janeiro to Portugal. It is the root of the *Cephaëlis Ipecacuanha*, (*Callicocca*,) *Pentandria monog.* Spr. *g.* 794, *sp.* 6., a low creeping plant, growing in the humid and umbrageous forests between 8° and 20° S. L. The root is perennial, simple, or divided into few diverging branches, entering the earth obliquely, bent and contorted, 4-6 inches long; about the thickness of a goose quill, generally attenuated towards the base and apex; annulated; rings unequal, commonly of the breadth of half the thickness of the root; epidermis smooth, and shining, when recent of a pale brown; when dry umber coloured, or blackish umber, or grey brown; bark, which forms the rings, equable, recent, softish, white, subamylaceous; dry, of a pale red, or shell red, shining resinous substance, and easily separating and exposing the central woody thread of a pale yellow colour. Of this kind of Ipecacuan three varieties occur, *I. annulata griseorubens; I. fusca vel nigra;* and *I. cinerea.* This plant was first imperfectly described by Piso in 1648. Dr Gomez gave an accurate description in 1801, which Brotero copied and sent as his own to the Linnæan Society. Richard, Martius and St Hilaire have all treated of it.

Brown ipecacuan was first brought into Europe about the middle of last century, and an account of it published about the same time by Piso; but it did not come into general use till about the year 1686, when Helvetius, under the patronage of Lewis XIV., introduced it into practice.

2. The black or striated ipecacuan * is exported from Carthagena to Cadiz. It is black within and without, fusiform, articulated, striated, and not annulated. It is the root of the *Psychotria emetica*, Spr. *g.* 792, *sp.* 7. A description was sent in 1765 by Mutis to Linnæus, who adopted it as furnishing the ipecacuan of commerce.

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* *Syn.* Ipecacuanha strié, I. noir, (*Fr.*) Schwarzeliche Ipecacuana, (*Ger.*) Ipecacuanha fusca, (*It.*)

3. The white ipecacuan *, called amylaceous by M. Merat, has been well described by M. Gomez. It is of a dirty white, and turns brown by drying; is simple or little branched, often 5 or 6 lines thick, 3 inches long and upwards, attenuated at its extremities, variously contorted, with transverse annular rugosities, but larger than those of the brown ipecacuan; bark thick, white, internally softer than the other; wood white, hard, fine as a thread; taste when fresh acrid, when dried farinaceous; smell nauseous when recent. It is the root of the *Richardia emetica, Hexandria monogynia,* Spr. *g.* 1309, *sp.* 3, or *Richardsonia Brasiliensis,* or *emetica,* and is exported to Portugal.

Neumann got from ipecacuan 7680 parts, 1440 alcoholic, and afterwards 1880 watery extract; and inversely, 2400 watery, and 600 alcoholic. Some additions to our chemical knowledge of this root were made by Boulduc, Lasonne, Cornette, Dr R. Irving, and M. Henry.

The discovery of emetine, as a peculiar principle in which the active virtue of ipecacuan exclusively resides, is entirely due to M. Pelletier, whose researches were made in conjunction with M. Magendie. They were read to the Academy of Sciences in 1817. The results of Pelletier's analysis of the bark and wood of the common brown annulated ipecacuan is subjoined, to which I have added the results of the analysis of the bark by A. Richard.

	Bark.	Wood.	Richard.
Emetine, -	16	1.15	16.
Fatty matter, -	2	traces	1.2
Wax, - -	6	...	
Resin, - -	...	...	1.2
Gum, - -	10	5.	2.4
Starch, -	42	20	53.
Extractive, not emetic,	...	2.45	...
Albumen, -	...	...	2.4
Lignine, -	20	66.6	12.5
Gallic acid, -	...	...	traces
Loss, - -	4	4.8	11.3
	100	100	100

The red annulated variety of ipecacuan was also examined by M. Pelletier, and found to contain emetine, 14; fatty matter, 2; gum, 16; starch, 18; lignine, 48; loss, 2=100. The striated ipecacuan, the root of the *Psychotria emetica,* contained emetine, 9; fatty matter, 12; lignine, gum, and starch, 79 = 100. The root of the *Cynanchum vomitorium* of Lamarck gave emetine, 5; gum, 35; vegeto-animal matter, 1; lignine, 57; loss, 3 = 100. The root of the *Viola ipecacuanha* yielded to Richard and Barruel emetine, containing a little saccharine matter, 3.5; fatty matter, ...; starch, 54; extractive soluble in water, and containing a new crystallizable principle, 22; lignine, 19; gallic acid, traces, = 100.

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* *Syn.* Poaya do campo, (*Braz.*) Ip. blanc, Ip. amylacé, (*Fr.*) Weisse Ip. (*Ger.*) Ip. bianca, (*It.*)

To obtain emetine, treat ipecacuanha powder with ether, which removes the oily, odorous matter, then exhaust the residuum by alcohol, evaporate the tincture to dryness, and redissolve the alcoholic extract in cold water, which leaves wax, &c. undissolved. Macerate the solution with carbonate of magnesia, to remove the gallic acid, and evaporate to dryness. Pelletier thinks that without the ether the greasy matter cannot be entirely got rid off. Thus prepared, it forms transparent scales of a brownish-red colour, has almost no smell, taste bitter, a little acrid, but not at all nauseous. It is slightly deliquescent in moist air, very soluble in water, soluble in alcohol, insoluble in ether, soluble in muriatic and phosphoric acids, very soluble in acetic acid, precipitated by infusion of nut-galls, by the acetate and especially the sub-acetate of lead, and is not acted upon by tartar emetic, or the salts of iron.

Emetine in this state is not yet pure. To get it pure we must use calcined magnesia, adding enough to combine with all the acid. The emetine is precipitated and mingled with the excess of magnesia, and a little colouring matter. This precipitate is to be carefully dried and treated with alcohol, which dissolves the emetine. The tincture is to be evaporated, and the extract is to be redissolved in a weak acid, and treated with purified animal charcoal. Lastly, the filtered liquor is to be precipitated by an alkali.

Pure emetine is white, pulverulent, inalterable in the air, while coloured emetine is deliquescent. It is sparingly soluble in water, but very soluble in ether and alcohol. Its taste is slightly bitter. It restores the blue colour of litmus reddened by an acid, and dissolves in all the acids, lessening but not neutralizing their acidity. It forms salts with excess of acid; and it is precipitated by galls, as the alkaloids of cinchona bark.

MM. Magendie and Pelletier ascertained that emetine is powerfully emetic, and has a specific action on the lungs and mucous membrane of the intestinal canal. It is also narcotic; and in large doses poisons dogs, by producing inflammation of the lungs and digestive canal. As a medicine, four grains dissolved in four ounces of water, given in divided doses, are sufficient for an adult.

Med. use.—The primary effect of ipecacuan is that of stimulating the stomach. If the dose be sufficiently large, it excites vomiting, by inverting the peristaltic motion of the stomach and duodenum; in a smaller dose it only produces nausea, and operates by stool; and in a still smaller dose it gently stimulates the stomach, increases the appetite, and facilitates digestion. Its secondary effects depend on the sympathy of other parts with the stomach; and in this way only can we explain its action as an antispasmodic, diaphoretic, expectorant, and in checking hæmorrhagies. Its beneficial effects, in some cases, also seem to be owing to the general concussion given to the whole system during the action of vomiting.

Ipecacuan, properly administered, often proves serviceable; 1. In intermittent fevers: An emetic sometimes prevents the paroxysm, when given about an hour before an expected accession, and also when given so as to produce vomiting at the time of an accession, or at the end of the cold stage. 2. In continued fevers: In the precursory stage of typhus fever, an emetic, succeeded by diluent diaphoretics, when administered sufficiently early in the disease, occasionally cuts it short; and when it fails in this desirable object, it always has a beneficial influence on the progress of the fever. 3. In inflammatory diseases, rheumatism, bubo, swelled testicle. 4. In profluvia, especially in dysentery, so much so, that it was formerly esteemed a specific against that disease; but Cullen attributes its good effects, in this instance, to its producing a steady determination of the peristaltic motion of the intestine downwards, when given in repeated small doses. 5. In many of the neuroses of Cullen; in epilepsy, asthma, dyspnœa, pertussis, dyspepsia, chronic diarrhœa, hysteria, melancholy, mania. 6. In cachectic diseases, as in some kinds of dropsy. 7. In impetiginous diseases; in jaundice. 8. In local diseases; in amaurosis, and several of the dysorexiæ. 9. Lastly, in every instance when we wish to evacuate the stomach, as when it is overloaded with food, or when poison, especially opium, has been swallowed.

The use of ipecacuan, as an emetic, is contra-indicated, 1. Where there is a disposition to hæmorrhagy; 2. Where there is an increased flow of blood towards the head; 3. In very irritable subjects; 4. In pregnant women, and persons afflicted with hernia.

Ipecacuan is exhibited, 1. In substance, in powder. Full vomiting will generally be produced in an adult by a scruple or half a drachm; and though less might answer the purpose, fortunately an overdose is scarcely attended with any inconvenience, as the whole of it is vomited with the contents of the stomach as soon as it operates. The vomiting is promoted and facilitated by drinking copiously of warm diluents. On the contrary, when vomiting is not intended, liquids must be drunk sparingly, and the dose must be diminished to a grain or less. In such small doses it is conveniently combined with any proper adjunct, in the form of powder, pill, or bolus. 2. In infusion. One drachm may be infused in four ounces of water, and taken in repeated doses till it operate. 3. Infused in wine.

Ipecacuan checks the narcotic effects of opium, and is therefore one of the best antidotes for its poison; and reciprocally the emetic powers of ipecacuan are checked by the addition of opium, and the combination operates by increasing the cuticular discharge.

Off. Prep.—Vinum ipecac., *D. L. E.* Pulvis ipecac. comp., *L. E. D.*

IRIS FLORENTINA. *Ed.*

Willd. *g.* 97, *sp.* 7; Spr. *g.* 165, *sp.* 35. *Triandria Monogynia.*—Nat. ord. *Ensatæ*, Linn., *Irideæ*, Juss.

Off.—The root. Florentine Orris *.

RADIX IRIDIS FLORENTINÆ.

THIS is a perennial plant, a native of the south of Europe. The root (*rhizome*,) is tuberous, oblong, about an inch thick, compressed, heavy, decorticated, white; parenchyme whitish; smell like that of the violet; taste bitter when dry; powder of a dirty white colour. It should be lifted in spring, and at least three years old.

Neumann got from 480 parts, 77 alcoholic, and afterwards 100 watery, and inversely 180 watery, and 8 alcoholic extract. The distilled water smells a little of the root, but exhibits no appearance of oil. Vogel got gum, brown extractive, fecula, fixed oil, a solid crystallizable volatile oil, and vegetable fibre.

Med. use.—They are chiefly used as a perfume, and chewed to conceal the fetor in the breath of those taking mercury. On the Continent issue pease are made of them, round, smooth, pierced with a hole, from one to three lines in diameter. These are inserted into an ulcer made by the cautery, in which they swell and cause irritation, which produces the secretion of pus.

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* *Syn.* Iris de Florence, (*Fr.*) Florentinischer Schwertel, Veilchenwurzel, (*Ger.*) Iride Fiorentina, (*It.*) Irsá, (*Hind.*) Ussulussosunul assman joonie, (*Arab.*)

JUNIPERUS.

Diœcia Monadelphia.—Willd. *g.* 1841; Smith, *g.* 421. *Diœcia Polyandria,* Spr. *g.* 3200.—Nat. ord. *Coniferæ,* Linn. Juss.

Sp. 10. Willd.; Spr. *sp.* 5; *sp.* 1. Smith. JUNIPERUS COMMUNIS. *Ed. Lond. Dub.*

Common juniper *.

Off.—The berries and tops.

a) BACCÆ JUNIPERI. *Lond. Dub.* BACCÆ JUNIPERI COMMUNIS. *Ed.*

b) CACUMINA JUNIPERI. *Lond.*

THIS is an evergreen shrub, growing on heaths and hilly grounds in all parts of Europe. It flowers in May, and the berries ripen in the harvest of the following year. Although the juniper is indigenous, great quantities of berries are imported from Italy, and Dr Sibthorp says, those of the *J. oxycedrus* from Greece. The ripe berries *(galbuli maturi)* are globular, covered when recent with a violet-black epidermis, becoming black when dry, marked with three furrows on the summit, having a brown fleshy pulp, of a heavy balsamic smell, and a taste at first sweetish, and afterwards bitterish, inclosing three plano-convex seeds. They should be dried by free exposure to the air.

They have been minutely analysed by Trommsdorff, who got water, 129; volatile oil, 10; wax, 40; resin, 100; sugar, with acetate and malate of lime, 338; mucus, with vegetable salts, 70; fibres, 350=1037.

Every part of the plant contains the same essential oil. The wood was formerly officinal, and used in fumigations.

Virey has given an account of the method of preparing the rob of juniper berries. The berries are boiled in water without crushing them. After boiling twenty minutes the decoction is filtered without expression. A second decoction is made in the same way. The liquors evaporated in the water bath to the consistence of an extract, form a very agreeable aromatic rob, slightly bitter, and a good stomachic and tonic. The dose is one or two drachms. In this way juniper berries yield about one-eighth of extract. But if the berries be crushed, as some authors advise, about double the quantity of a dark brown, thick, harsh, unpleasant extract is obtained. It has also the inconvenience of clotting during the boiling, because the particles of the resin cohere. By making this extract by *cold* maceration, a mild semitransparent rob is obtained, of an amber colour, and a sweet saccharine taste. Care must be taken to decant the infusion before its concentration to separate the resinous deposit. By the addition of sugar or honey, we get a conserve of juniper, which is highly esteemed in the countries of the North.

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* *Syn.* Αρκευθος μικρος, (*Dios.*) Κεδρος, (*Gr. Hod.*) Genevrier commun, (*Fr.*) Gemeiner Wachholder, (*Ger.*) Ginepro, (*It.*)

In warm climates a resin exudes from the juniper. It has been confounded with Sandarach, which is the product of the *Thuja articulata.* Juniper resin is of a dirty green colour, translucent at the edges, smelling slightly of juniper berries, and tasteless. It is readily soluble in alcohol, ether, and volatile oils, slightly in cold fixed oils, more abundantly in warm. The solution has a peculiar acrid taste: it is slowly converted by nitric acid into a bitter principle, and quickly forms a dark red solution with sulphuric acid. In a boiling potass ley it becomes harder and firmer, without being dissolved or forming a soap; and, on the contrary, it is soluble in water of ammonia, even cold, making a clear green solution.

Med. use.—To the oil juniper berries are indebted for their stimulating, carminative, diaphoretic, and diuretic properties. They are most commonly used in the form of infusion, as a diuretic drink in dropsy. The essential oil may be separated by distillation. It possesses the same properties in a higher degree, and imparts them to ardent spirits. The peculiar flavour and well-known diuretic effects of Hollands are owing to the oil of juniper.

The tops are used in the form of infusion as a diuretic.

Off. Prep.—Oleum juniperi, *D. L. E.* Spiritus juniperi comp. *D. L. E.*

Sp. 6. Spr. *sp.* 21. JUNIPERUS SABINA. *Ed. Lond. Dub.* Savine [*].

Off.—The leaves.

FOLIA. *Ed. Lond. Dub.*

THIS is an evergreen shrub, a native of Siberia and Tartary, but not unfrequent in our gardens. It is a shrub or tree, rising to the height of 8–10 feet. The stem is upright and very branchy, branches opposite, erect, small, and very pliant; leaves very small, lancet-shaped, oval, pointed, smooth and dark green; bark of the young branches light green, of the trunk rough, ash-grey, and somewhat reddish. It flowers in April, and ripens its fruit in harvest of the second year. The ends of the branches, with the young leaves, are collected in April. They have a bitter, acrid, biting taste, and a strong disagreeable smell: distilled with water, they yield an essential oil in considerable quantity, about one drachm and a half from a pound of the fresh leaves.

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[*] *Syn.* Savinier, (*Fr.*) Sadebaum, Sevenbaum, (*Ger.*) Savina, (*It.*)

Med. use.—Savine is a warm stimulating medicine, capable of producing diaphoresis, and increasing all the secretions, but apt to excite hæmorrhagy, especially from the uterus. It is also recommended as an anthelmintic, and is said to be very efficient in the cure of gout.

Internally, a conserve of the fresh leaves is exhibited in doses of from half a drachm to a drachm.

Externally, the leaves are applied, in the form of powder or infusion, to warts, carious bones, and old ulcers, and in cases of gangrene, psora, and tinea: an excellent issue ointment is also prepared by boiling the leaves in oil.

The essential oil is a very active remedy, and said to produce abortion.

Off. Prep.—Oleum volatile sabinæ, *E. D.* Unguentum sabinæ, *D.* Ceratum sabinæ, *L. E.*

Sp. 14. JUNIPERUS LYCIA. *Ed. Lond. Dub.* Syn. *J. Phenicia,* Spr. *sp.* 18.

Off.—A gum resin *.

GUMMI-RESINA. *Ed.* OLIBANUM; gummi resina. *Lond.*

OLIBANUM, or frankincense, has been considered as the product of this shrub since the time of Linnæus; but the authority upon which Linnæus ascribed frankincense to the *Juniperus Lycia* is not known, and it is probably erroneous. Dr Sibthorp describes it as indigenous in Greece, and says nothing of its producing olibanum. It is also found in the south of France, and there it exudes no gum-resin. The East Indian frankincense is known to be the product of the *Boswellia serrata;* but it is still doubtful what tree yields the Arabian and African frankincense. Adanson and Lamarck refer it to the *Amyris kafal,* which however seems identical with the *Amyris kataf;* and it is not probable, as Hayne properly remarks, that the same species should yield both myrrh and frankincense. Ehrenberg in his travels heard nothing of the collection of frankincense; but at Suez he met with it, brought from India, to be sent into Europe.

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* *Syn.* Λιϐανωτος, (*Gr.*) Thus, (*Off.*) Encens, (*Fr.*) Weirauch, (*Ger.*) Incenso, (*It.*)

Guibourt describes the African frankincense as consisting of yellow tears, mixed with a larger quantity of reddish tears and lumps, (*marrons.*) The purest tears are oblong or roundish, generally small, of pale yellow, not very brittle, fracture dull, waxy, not transparent, by which they are distinguished from mastiche. In the mouth they soften and have an aromatic slightly acrid taste. Their smell is like a mixture of rosin and tacamahac. The lumps are reddish, easily softened by the heat of the fingers, have a stronger smell and taste, and mixed with impurities, especially small crystals of calcareous spar.

KINO. *Dub.* Succus spissatus Eucalypti resiniferæ. *Ed.* Pterocarpi erinaceæ extractum. Encyclop. Method. *Lond.*

KINO, the inspissated juice of the brown gum-tree of Botany Bay. The gum-resin of the hedgehog pterocarpus.

KINO was first noticed by Dr Fothergill, who received it from a druggist as a very fine kind of dragon's blood, and described it as the produce of an African tree called the *Pau de Sangue.* Since that time many different substances have been from time to time in commerce as kino, and those which were at one period most common have been afterwards neglected, and are no longer to be obtained. Hence a great deal of confusion exists in regard to this substance, which I believe that I was the first to remove in some degree.

Kino may be distinguished as derived from two very different sources; the one being natural concrete juices; the other artificial extracts. The former are generally characterized by having rather a heterogeneous appearance, mixed with bits of bark or leaves, partially marked with the impression of a bark, and translucent on the edges of small fragments. The extracts are characterized by being almost homogeneous, and marked with the impression of the vessel in which they have been consolidated, and by their complete opacity even in thin fragments.

a. Concrete Juices.

1. *African Kino.*—In Moor's travels up the Gambia, there is a very imperfect account of the *Pau de Sangue* from which it exudes, and a copy of directions from the African Company to their factors, to collect and purchase this gum; but it seems to have been brought to them only in very small quantities, and mixed with gum Senegal. Mr Park in his second mission to Africa, when on the river Gambia in 1805,

sent home a branch and fruit of this tree, and a paper of its concrete juice, with the information that none of it was then exported, but that it might be collected in considerable quantity. Mr R. Brown ascertained the tree to be the *Pterocarpus erinacea* of Lamarck and Poiret, and the London College have followed his authority. The same tree was afterwards described and figured by Dr Hooker, in the Appendix to Gray's Travels, under the name of *Pt. Africanus.* He adds, that it is known among the natives by the name of *Kari*, affording one of the best kinds of gum kino. The London College certainly err in describing this variety of kino as an extract. They might with equal propriety consider opium as an extract.

2. *Botany Bay Kino.*—When I first examined kino in 1802, this was common, and was the finest kind in commerce. By Dr A. T. Thomson, we are told, that for the last twenty years none of it has been imported. I may, however, retain my description of it. It occurs in dark brown masses of various sizes, either smooth or rounded on the surface, or in fragments often covered with a reddish-brown powder, fracture resinous and very unequal, appearance sometimes homogeneous, but more commonly heterogeneous, mixed with bits of twigs, leaves, &c.; splinters transparent, ruby red; no smell, scarcely crackling under the teeth, but sometimes gritty, from the accidental mixture of sand; taste simply astringent, succeeded by sweetness, and, when long chewed, a portion adheres to the teeth; infusible and friable; powder reddish-brown. This is certainly obtained from the *Eucalyptus resinifera*, or brown gum-tree of New South Wales, by allowing the juice, which either flows from it spontaneously, or is procured by wounding the tree, to harden in the sun. Some specimens of it in its fluid state have even reached this country.

3. The Dublin College, in their first edition, indicated the *Butea frondosa* as the source of kino, but certainly erroneously. It however produces in large quantities a red juice, very analogous to kino, and which may unquestionably be used as a substitute for it.

4. I picked a portion of a red astringent matter, exactly like kino, from a cavity in a plank of beef-wood, *Cassuarina equisetifolia*. There may be other concrete juices of the same nature.

b. Extracts.

1. One occurs in very small jet-black fragments, perfectly opaque, without smell, crackling under the teeth when chewed, not colouring the saliva, after some time imparting

only a slight astringent taste, not fusible, and difficultly reduced to powder. Powder dark chocolate-brown. Although this has been the longest known in commerce in this place, I have not been able to trace the place of its origin. It is evidently an extract, and corresponds very nearly with Dr A. T. Thomson's description of Jamaica kino. It is also scarcely to be distinguished from the extract of the *Swietenia febrifuga*, sent home by Dr Roxburgh; and I am told it is imitated by an extract of oak bark, which is sometimes substituted for kino.

2. The kino imported by the East India Company resembles the preceding in many particulars. It is called Amboyna kino, and is said to be the extract of the *Nauclea Gambir*. If this be correct, a particular process must be followed, for otherwise this plant furnishes a kind of catechu.

3. In large fragments, on some of which the impression of the vessel into which it had been received while fluid, and in which it had hardened, was evident; colour very dark brown, fracture resinous, appearance homogeneous, with small air bells; in very thin splinters, transparent, and of a ruby red colour: crackling under the teeth when chewed; taste at first somewhat acid, but afterwards becoming considerably bitter and astringent, succeeded by a peculiar sweetness; infusible, and friable; powder of a reddish-brown. This I was informed by Dr Wright was the extract of the *Coccoloba uvifera* or seaside grape; and indeed, by comparing it with specimens of that extract, I have no doubt of the accuracy of the information. The late Dr Murray was told it was the extract of the mahogany wood, which may be also true.

The production of kino from so many different trees in Africa, America, Asia, and New Holland, shews that kino is to be considered as a genus of which these are species.

The chemical constitution of kino was first published by myself in 1803, in the first edition of this Dispensatory; and my conclusion from these experiments, that it consists principally of tannin, and cannot with propriety be classed among the resins or gum-resins, was confirmed by an analysis which Vauquelin published soon after, without any knowledge of what I had done.

Kino is much more soluble in boiling than in cold water. The decoction, therefore, on cooling, becomes turbid, with a very copious red sediment. Alcohol dissolves the whole of the Botany-bay kino except its impurities. With a certain proportion of water, this tincture lets fall a copious red precipitate, which may be separated by filtration, but with a larger proportion of water its transparence is only slightly disturbed. It is also remarkable, that alcohol dissolves kino entirely, but does not dissolve the residuum of the decoction. The solutions of kino precipitate gelatine, and, according to Vauquelin, silver, lead, and antimony, white; and iron, green. I find that it resembles other astringents, in forming a black precipitate with persulphate of iron, which however is converted into green by the slightest excess of the sulphate, and by a larger excess is dissolved into a bright green liquid.

Med. use.—Kino is a powerful remedy in chronic diarrhœas and dysenteries; in all passive hæmorrhagies, especially from the uterus; in fluor albus, and in diseases arising from laxity of the solids.

It is exhibited internally, in doses of from ten to thirty grains, in substance, or dissolved in diluted alcohol.

Externally, it is applied as a styptic, to check hæmorrhagies from wounds or ulcers, and to diminish the discharge of sanious or ichorous matter from ill-conditioned ulcers.

Off. Prep.—Pulv. kino comp. *D. L.* Tinct. kino, *D. L.* Electuarium catechu comp. *D. E.*

KRAMERIA TRIANDRA. *Lond.* Ruiz. *Dub.*

Persoon, *Tetrandria Monogynia*, *g.* 292, *sp.* 1; Spr. *Didynamia Angiospermia*, *g.* 2255, *sp.* 3.—Nat. ord. *Polygaleæ*, Juss.

Off.—The root. Rhatany root. The extract.

a) RADIX. *Lond. Dub.*

b) EXTRACTUM. *Dub.*

RHATANY ROOT has been made known to botanists, and introduced into medical practice by M. Ruiz. It seems to be derived from the *K. Ixina*, as well as the *K. triandra.* Its name of rhatany is derived from the mode of growth, which is creeping. As brought in commerce, the root consists of cylindrical ramifications, varying in size from that of a quill to a finger. It consists of a bark of a deep brown colour, slightly fibrous, extremely astringent, without bitterness, and a central wood of a reddish yellow colour, and less taste.

The analysis of rhatany root shews that it is a pure astringent. It is said to contain about 38 *per cent.* of a red astringent matter, differing in some particulars from the tannin of galls. It contains no resinous matter. Gmelin could not detect in it any gallic acid; and Peschier thinks it contains a peculiar acid, which he has called *Krameric*, and which forms crystallizable permanent salts with alkalies.

The extract of rhatany root prepared in America can scarcely be distinguished from kino, when an extract. Vogel says that when heated, kino is charred without altering its form, while rhatany extract previously melts and swells very much. But this may be owing to the latter not being so thoroughly dried.

Med. use.—In this respect rhatany agrees with other astringents. Its extract is similar to kino, catechu, and extract of logwood.

LACTUCA. *Ed. Lond. Dub.*

Willd. *g.* 1404; Spr. *g.* 2886; Smith, *g.* 342. *Syngenesia æqualis.*—Nat. ord. *Compositæ semiflosculosæ*, Linn., *Synantheræ*, sect. *Cichoraceæ*, Juss.

Sp. 12. Spr. *sp.* 11. LACTUCA VIROSA. *Ed. Dub.*

Strong-scented lettuce.

Off.—The herb.

HERBA. *Ed. Dub.*

THIS plant, often confounded with *L. scariola*, flowers in August and September, is biennial, and grows wild on rubbish and rough banks in many places in this country.

The whole plant abounds with a milky juice, intensely bitter, considerably acrid, and having a strong virose smell like opium.

Med. use.—The inspissated juice of the leaves of the strong-scented lettuce, gathered when in flower, has been given in dropsies of long standing, proceeding from visceral obstructions, to the extent of half an ounce a-day, but the extract must have been ill prepared. It is said to agree with the stomach, to quench thirst, to be gently laxative, powerfully diuretic, and somewhat diaphoretic. Plentiful dilution is allowed during its operation. Dr Collin of Vienna asserts, that out of twenty-four dropsical patients, all but one were cured by this medicine.

Off. Prep.—Succus spissatus lactucæ virosæ, *E.*

Spr. *sp.* 19. LACTUCA SATIVA. *Ed. Lond.*

Garden lettuce.

Off.—The herb and its concrete juice.

a) HERBA LACTUCÆ SATIVÆ. *Ed.* LACTUCA. *Lond.*

b) LACTUCARIUM. *Ed.*

THIS succulent vegetable, which is a valuable sallad, abounds with a cooling, bland and pellucid juice before its flower stem shoots, after that with a milky juice of an intensely bitter taste, which becomes brown on drying by exposure to the air. The juice has been analysed by John of Berlin. Dr Klink, with the assistance of Professor Pfaff of Kiel, made experiments on the fresh juice, and its action on various reagents. The inspissated juice was found to consist of 41 parts soluble in water; 7 of wax; 6 of resin; 18 of caoutchouc; and 8 loss = 80. It contained a free acid analagous to, but not identical with, the oxalic acid, and a narcotic principle like that of hemlock or henbane, but no morphia.

Although the soporific power of lettuce was known to the ancients, the effects of its inspissated juice were first ascertained by Dr Coxe of Philadelphia; but it is owing to the perseverance and recommendation of Dr Duncan senior, that preparations of lettuce have been admitted into the British and some foreign Pharmacopœias.

Mr Young, surgeon of Edinburgh, has taken great pains to bring the various preparations of lettuce to perfection. To the milky juice obtained by incisions made in the flowering stem, collecting the juice on the finger as soon as it exudes, and speedily dried by exposure to the air, he gives the name of *Lettuce opium.* It is now prepared on a very large scale, and occurs in commerce in round hard masses of a wood brown colour, with a strong virose smell, having a strong resemblance to Turkey opium, but none to an extract. Although the process of Mr Young is that by which, as in opium, the virtues of the plant are obtained in their most natural state, the expense is great, and various attempts have been made to lessen it.

Dr Probart collects the milky juice as it exudes from the cut stem, upon pieces of wove cotton about half a yard square, and from time to time throws them, as they become charged, into a vessel containing a small quantity of water, which when sufficiently impregnated is evaporated by simple exposure in shallow vessels. This process will furnish a very pure extract, and free from the caoutchouc, but it is still expensive. Dr Probart further observed, that after the plants have flowered, and the leaves are beginning to assume a yellow hue, the milky juice assumes a concrete form, and is contained in the bark of the stalks and in the old leaves. He therefore uses these only, which he macerates in water for 24 hours, then boils for two, strains off the decoction without pressure, and evaporates first by heat, and then in shallow dishes. This he calls *Extractum lactucæ concentratum,* which he says is about half the strength of the lactucarium, but obtained at one-sixth of the expense.

The term *Lactucarium* is unfortunately applied to different preparations. Many give it to what Mr Young calls lettuce opium, and to this it should be restricted. Dr Duncan senior uses it for the extract of the tincture of the same substance, and Mr Young for its extract obtained by alcohol and water. The *Thridace* of Dr François is the inspissated expressed juice of lettuce.

Med. use.—The remarkable similarity of the taste of shot-lettuce to that of opium, induced Dr Coxe to make a series of experiments with lettuce opium. " These experiments were made on frogs as well as on the human subject. The laudanum made from the opium of the lettuce increases the pulse in force and frequency, and produces generally the same effects as result from similar doses of common laudanum. It has been used with advantage in allaying the pain of chronic rheumatism and colic; in checking the frequent stools accompanying diarrhœa; in allaying cough," &c. &c. Since Dr Duncan senior wrote his treatise on pulmonary consumption, and recommended lactucarium as a substitute for opium, possessing its anodyne without some of its injurious effects, its use has become very general in all complaints in which anodynes are required.

Off. Prep.—Succus spissatus lactucæ sativæ, *E.*

LAURUS[*].

Willd. *g.* 798. *Enneandria Monogynia.*—Nat. ord. *Oleraceæ*, Linn., *Laurineæ*, Juss.

Sp. 1. LAURUS CINNAMOMUM. *Ed. Lond. Dub.*

The cinnamon tree[†].

Off.—The inner bark and its essential oil.

a) CORTEX. *Ed. Dub.* (Liber.) *Lond.*

b) OLEUM CINNAMOMI. Ejus oleum essentiale. *Lond.* OLEUM VOLATILE. *Dub.*

Sp. 2. LAURUS CASSIA. *Ed. Dub.*

The cassia tree[‡].

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[*] The cinnamon trees differ in many respects from the true laurels, and have been separated from them by various botanists. Burmann made them a separate genus under the name of *Cinnamomum*, and this is adopted by R. Brown, Hooker and Don. Gærtner referred them to a genus he called *Persea*, and he has been followed by Sprengel.

[†] *Syn.* Canelle, (*Fr.*) Zimmetrinde, Kaneel, (*Ger.*) Canella, (*It.*) Kúrúndū, (*Cyng.*) Kárrúwā puttay, (*Tam.*) Kulmie darchiniē, (*Duk.*) Darchinie, (*Pers. Hind.*) Sánálinga putta, (*Tel.*) Kaimanis, (*Malay.*) Darsini, (*Arab.*)

[‡] *Syn.* Cassia lignea, (*Off.*) ? Casse, (*Fr.*) Mutterzimmet, (*Ger.*) Cassia, (*It.*) Lavanga puttay, (*Tam.*) Ilavanga, (*Màleàlie.*) Mookalla, (*Cyng.*) Tuj, (*Hind.*) Darchinie, (*Duk.*) Kayū-manis, (*Jav. Bali.*) Kayū-legi, (*Malay.*)

Off.—The bark and flower-buds gathered before they open.

a) CORTEX. *Ed. Dub.*

b) FLORES LAURI CASSIÆ. Flores nondum expliciti. *Ed.*

I have united these two species in one article, not that they are botanically the same, but because part at least of the cassia bark of commerce is the product of the same species which yields the true cinnamon, and because botanists are not agreed concerning their individuality or products. For the most accurate information concerning the cinnamon we are indebted to Mr Marshall, who has corrected several errors promulgated by Burmann, Thunberg, and others. The finest cinnamon is the growth of Ceylon, and I shall describe what is necessary regarding its production, without entering upon the doubtful question, whether the same species grows in other parts of India. The cinnamon tree of Ceylon is well known, has been successfully introduced into Guaiana, Cayenne, the Brazils, and several of the West India islands, and is not unfrequent in our stoves. " The tree grows to the height of 20–30 feet; trunk, 12.18 inches in diameter, covered externally with an ash-coloured, thick, rough and scabrous bark; inner bark reddish. The bark of the young shoots is often beautifully speckled with dark green and light orange colours." " Leaves oblong, 6–9 inches long; 2-3 broad; both ends sub-acute, entire, flat; three-nerved *, lateral nerves vanishing as they approach the point; smooth; superior surface dark green, shining; inferior, green; grow in pairs opposite crossed. The young leaves have in general a scarlet, or light liver colour, with yellow veins. As they acquire maturity, they become olive, then green, and before they fall, olive-yellow; mature leaves, when bruised, have a strong aromatic odour; and the biting sharp taste of cloves. Petiole half cylindrical, slightly channelled above, about three-fourths of an inch long, has the odour and taste of cinnamon."

The fruit is an oval berry, larger than a black currant, adheres to the receptacle like the acorn; the receptacle is thick, green, and hexangular; when ripe the skin is bluish-brown, thickly scattered with white spots; under the skin is a greenish pulp, slightly acrid; has a terebinthine odour, and tastes, in some degree, like the berries of the juniper. The pulp covers a thin tough shell, which contains an oily, soft, pale rose-coloured, inodorous kernel. The tree emits no smell. The odour of the flowers is to most people disagreeable, like newly sawn bones. The prepared bark is cinnamon; the root by distillation yields camphor; the leaves by the same process furnish a clove-flavoured oil; the receptacle of the seed is the cassia bud of commerce; (?) and by decoction a white suety matter is obtained from the kernels.

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* They are in reality five-ribbed, as correctly pointed out by Nees von Esenbeck. I have found this to be the case in leaves sent from Ceylon and from St Vincent's, as well as in the plants in our stoves.

Many different kinds of cinnamon bark have been mentioned by authors; but Mr Marshall says, the distinctions are arbitrary and comparative, imaginary and ill defined. " Two peelers rarely ever agree in giving the same denomination to a similar piece of cinnamon. The diversities of the quality of cinnamon do not appear to arise from any varieties of the plant, but from care and skill in its preparation, the soil and exposure of the country, the age and health of the plant. The cinnamon tree is rarely found, except on the south and west aspect of the island. It is chiefly procured between Negombo and Matura: beyond these limits the bark is never of a good quality; it has little taste, and is greatly deficient of the spicy aromatic flavour of cinnamon. Even between these limits the cinnamon is not of the same quality: exposure, soil, shade, and other circumstances, have powerful effects in producing a corresponding variety of the excellencies and defects of the produce of the tree." The peeling commences in May, and continues till late in October. When the peeler perceives a bush with shoots of a proper age for cutting, he tries whether the bark will separate easily from the wood, and when it will not, it is not deemed fit for cutting, and they do not cut shoots or branches whose diameter is much less than half an inch, or more than two or three inches. The epidermis and green matter under it are carefully scraped off, when the bark speedily dries, contracts, and assumes the appearance of a pipe. These are inserted into each other to make them about 40 inches long, and made up into bundles of about 30 lbs. weight. " When newly prepared, cinnamon has a most delicious odour; this odoriferous quality becomes gradually fainter. Cinnamon is at first a light orange colour, which becomes a shade darker by exposure to the air. The bark of old trees acquires a reddish-brown colour. Shortly after the cinnamon is deposited in the storehouses, the inspection of it commences. The East India Company employ an inspector and two assistants to superintend the sorting and baling of the cinnamon. The manipulation is performed by natives. Each bundle is placed on a table or large bench, the bundle is untied, and the cinnamon examined quill by quill. It is divided into a first, a second, and a third, or rejected sort. The first and second sorts are alone deemed of a quality fit to form the Company's investment. The sorting of cinnamon consists chiefly in detecting or separating what is coarse, and otherwise of a bad quality, including the impositions of the peelers. This is chiefly performed by inspection. Habit soon enables the people employed to discover by a single glance of the eye what is considered defective. Tasting is very rarely had recourse to. The bark of the large shoots, or thick branches of trees, produces coarse cinnamon, which is generally rejected by the sorters. This cinnamon is thick, and has a reddish-brown colour, rough surface, loose texture, and is coarse-grained. It breaks short, shivery, and crumbling. When chewed it is disagreeably pungent, feels gritty, ligneous, and sandy in the mouth. The peelers occasionally scrape off the external pellicle of this quality of cinnamon. This operation thins the cinnamon and improves the colour, but leaves it with a coarse, rough surface. This quality of cinnamon is always rejected. Cinnamon prepared from the bark of very young and succulent shoots is rejected. It is light straw-coloured, thin, and almost without flavour or taste; and what little aroma it possesses is very evanescent. Mildewed or half-rotten and smoky cinnamon is rejected.

That which is considered in Ceylon as of the best quality is of a light yellow colour, approaching nearly to that of Venetian gold; thin, smooth, shining; admits of a considerable degree of pressure, and bending before it breaks; fracture splintery; has an agreeable, warm, aromatic flavour, with a mild degree of sweetness. When chewed, the pieces become soft and seem to melt in the mouth. The first and second sorts are weighed, and put up into bundles, each weighing 92½ lb. English. The Company export their cinnamon from Colombo or Galle. The interstices between the bales are filled with black pepper. This mode of packing was generally practised by the Dutch, and has been scrupulously adhered to by the English.

The cassia bark of commerce occurs in unequal tubes, or semitubular segments of 12–18 inches long, and from 1-4th to an inch in diameter; with the external layer much thicker than that of cinnamon; externally more of a dark red, traversed with thicker and more shining straight or serpentine veins; fracture paler, more fibrous; internal layer coarsely fibrous; less distinct from the external, and less shining, brownish-yellow, with an aromatic cinnamon smell, but not so strong or agreeable, and a corresponding taste, more acrid, burning and lasting, at the same time mucilaginous. Mr Marshall asserts, and he could not be mistaken, "that it is well known that the rejected cinnamon, or third sort of that prepared in Ceylon, has been imported into England, and sold under the denomination of Cassia," p. 253; and in another place he says, The Ceylon government has, for a number of years, disposed of part of the rejected cinnamon to private merchants, who "purchase it with the avowed purpose of supplying the Indian markets; great part of it, however, eventually reaches England, under the denomination of Cassia." But the greater part of what is called Cassia comes from Canton, and is the product of the Sooloo Archipelago, and other islands in those seas, and of Cochin China*. The species furnishing it is not ascertained.

Cassia bark is also brought from Malabar, and is there called Dhál-China. It is however said to be very inferior to that from China. The buds of this tree are called Cabob-China, and are exported also to Muscat, Cutch, Surat, and Bombay. Dr Buchanan does not doubt that this is the *L. Cassia* of Lin. Van Rheede describes two species as growing in Malabar; the one he calls *Carua*, and the other *Kátou-Cárua*. He says that the bark of the former, torn off in the proper season, and dried in the sun, is cinnamon; but that it is less hot than that of Ceylon, and as if wild, *(sylvestris)*; that the leaves have a strong aromatic odour, especially when rubbed, emitting the very odour of cinnamon, and having also the taste of cinnamon, but less lively. This species is commonly considered to be the *L. cassia* Lin., and probably is the tree alluded to by Dr Buchanan. Some cassia (Cooleet manees) is also furnished from Sumatra; but from what species is unknown. It therefore appears that the term of Cassia is applied to every analogous bark inferior in quality to the fine Ceylon cinnamon; that a part of it is the coarser bark of the Ceylon tree, but that a large proportion is probably furnished by other species, of which the *L. cassia* is one; for the negative statement of Mr Marshall, quoted in a former edition by me, refers to the *Litsæa Zeylanica*, which he supposed to be the *L. cassia.*

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* Louriero describes the Cochin-China cinnamon tree as the *L. cin.* L., which it seems to be, although Nees von Esarbeck refers it to *L. cassia* L., which it certainly is not. Louriero has also given a very good description of the taste and value of the bark compared with that from Ceylon. I am indebted to Mr Crawford for two varieties. The one is half a line or a line thick, flat, flexible, of a dark brown colour, but the whole surface coloured with a white powder, evidently foreign; adhering, epidermis smooth, slightly warty; inner surface uniform; fracture short, showing three layers; outer and inner dark brown colour, with a very thin intermediate layer more fibrous, and almost white. The other is three quarters of an inch thick, having the same white powder adhering; outer surface rugose, inner slightly fibrous; fracture exhibiting three layers; outer more than half the thickness of the whole, spongy, of a lighter brown; middle thin pale cinnamon colour and fibrous, and inner dense, dark brown. The taste of both varieties is equal to that of the finest Ceylon cinnamon, perhaps more pungent.

The Cassia buds of European commerce are brought from China. They are pear-shaped bodies, about three lines long and two lines broad, consisting of the persistent cupuliform calyx, with the adhering pedicelle, and firmly embracing the germen. The calyx is turbinated, and toothed, with the teeth clasped over the germen, of which it allows only the stigma to be seen. The surface of the calyx and pedicelle is rugose, of a dark brown colour; the germen is monolocular, free, somewhat lenticular, paler and smooth on its surface. The flavour and taste resemble those of cinnamon bark, being highly aromatic, sweet and pungent. By immersion in cold water cassia buds get softer, and render the water somewhat mucilaginous. It is very uncertain from what species these buds are obtained. Mr Marshall, admitting however that they are not collected in Ceylon, speaks as if they were the unripe fruit of the true cinnamon tree; but these, in undoubted specimens in my possession, differ essentially in the form of the germen, which is oblong and pointed, and not flat; in its being less included within the calyx, and especially in the calyx being deeply divided, instead of being toothed. It may not be irrelevant to mention here, that the mature fruit of the Ceylon cinnamon is well represented in Gærtner's figure of the *L. cassia* L., and is quite different from that given of the *L. cinnamomum* L. Cassia buds are likewise said to be collected in Malabar; but specimens sent from Madras, which I owe to the attention of the late Governor, Sir Thomas Munro, are totally different from both of Gærtner's figures, and indeed do not seem to belong to any species of this genus. They have also nothing of the cinnamon flavour, and taste rather like cubebs.

By distillation with water, cinnamon bark furnishes a small quantity of very pungent and fragrant oil; the water itself remains long milky, and has a strong flavour of cinnamon. The process is simple: the bark is grossly powdered and macerated for two days in sea water, when both are put into the still. A light oil comes over with the water, which swims upon its surface, and a heavy oil, which sinks to the bottom of the receiver. The light oil separates from the water in a few hours; but the heavy oil continues to precipitate for 10 or 12 days. The heavy oil, which separates first, is about the same colour as the light oil; but the portion which separates last has a browner shade than the supernatant oil. In future distillations the saturated cinnamon water is advantageously used, added to sea-water, to macerate the cinnamon. 80 lb. of newly prepared cinnamon yield about 2½ oz. of oil, which floats upon the water, and 5½ of heavy oil. The same quantity of cinnamon, if kept in store for several years, yields 2 oz. of light oil, and 5 oz. of heavy oil.

On some occasions the Ceylon Government has directed oil to be extracted from cinnamon, whose quality did not permit it to form part of the Company's investment. The Dutch were accused of deteriorating their cinnamon by mixing it with a proportion of real cinnamon, but which had been deprived of its essential oil by distillation. This fraud could only be detected by the weaker smell and taste. It is also often mixed with the coarser bark called cassia. This last is easily distinguishable by its fracture being smooth, and by its slimy mucilaginous taste, without any of the roughness of the fine cinnamon.

The watery extract in Neumann's experiment amounted to 720 from 7680 parts. With alcohol the oil did not rise in distillation, but remained in the extract, which amounted to 960. Vauquelin also analyzed it, and obtained volatile oil, tannin, colouring matters, and an acid. He also made a comparative analysis of the Ceylon and Guaiana cinnamon, and found the difference to consist in the oil, which in the latter was much sharper, and in some degree peppery. The oil of cinnamon of commerce independent of adulteration is various in quality. The finest has the pure cinnamon flavour, and the inferior has a considerable admixture of the clove flavour; and when we consider that the leaves yield an oil with that flavour, it is not improbable that the fine oil is furnished by the bark alone, and the inferior oil by a mixture of bark with leaves.

The essential oil of cinnamon has a whitish-yellow colour, a pungent burning taste, and the peculiar fine flavour of cinnamon in a very great degree. It should be entirely soluble in alcohol. It is principally prepared in Ceylon.

Med. use.—Cinnamon is a very elegant and useful aromatic, more grateful both to the palate and stomach than most other substances of this class. Like other aromatics, the effects of cinnamon are stimulating, heating, stomachic, carminative, and tonic; but it is rather used as an adjunct to other remedies, than as a remedy itself.

The oil is one of the most powerful stimulants we possess, and is sometimes used as a cordial in cramps of the stomach; as a stimulant in paralysis of the tongue, or to deaden the nerve in toothach. But it is principally employed as an aromatic, to cover the disagreeable taste of other drugs.

Off. Prep.—Aqua cinnam., *L. E. D.* Inf. catechu, *L. D.* Decoct. hæmatox., *D.* Spirit. cinn., *L. E. D.* Spt. lavand. comp., *L. E. D.* Spt. ammon. aromat., *D.* Tinct. cardamom. comp., *L. D.* Tinct. catechu, *L. E. D.* Tinct. cinnam., *L. E. D.* Tinct. cinnam. comp., *L.* Spt. ætheris aromat., *L.* Vinum opii, *L. D.* Acid. sulphuric. aromat., *E. D.* Pulvis cinnam. comp., *L. E.* Pulv. cretæ comp., *L. E. D.* Pulvis kino comp., *L. D.* Elect. catechu comp., *D.* Confectio aromatica, *L. D.* Emplast. aromat., *D.*

Sp. 3. LAURUS CAMPHORA. *Ed. Lond. Dub.*

The camphor laurel grows in great abundance, and to a very considerable size, in the forests of Japan. It is not uncommon in greenhouses in England. For the mode of extracting the camphor, and for its properties, chemical and medical, see the article CAMPHORA.

Sp. 10. LAURUS NOBILIS. *Ed. Lond. Dub.*

Bay tree *.

Off.—The leaves, berries, and expressed oil of the berries.

a) FOLIA LAURI. *Lond. Ed. Dub.*
b) BACCÆ LAURI. *Lond. Dub. Ed.*
c) OLEUM FIXUM LAURI NOBILIS. *Ed.*

THIS tree is a native of the south of Europe, but bears the winters of this climate perfectly well in sheltered situations. Both leaves and berries contain a considerable quantity of essential oil, which renders them aromatic stimulating substances.

The berries are generally brought from the Mediterranean, and are more pungent than the leaves. In Spain and Italy a considerable quantity of oil is obtained by expression from the fresh berries. It has a green colour, and strong aromatic taste and smell. As it therefore is not a fixed oil, but a mixture of fixed and volatile oil, and as its peculiar properties depend entirely on the presence of the latter, it is incorrectly stated to be a fixed oil by the Edinburgh College. It should rather have been denominated, from the mode of its preparation, an expressed oil.

Med. use.—The oil is used externally as a stimulant. I do not know if the leaves be employed, but they might aromatize a bath.

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* *Syn.* Δαφνη, (*Diosc.*) Laurier, (*Fr.*) Lorbeer, (*Ger.*) Lauro, Alloro, (*It.*)

Off. Prep. of the berries.—Conserva rutæ, *D. L.* Emplast. cumini, *L.*

Sp. 34. LAURUS SASSAFRAS. *Ed. Lond. Dub.*

Sassafras *.

Off.—The wood, root, and oil.

a) LIGNUM. *Ed. Lond. Dub.*
b) RADIX. *Ed. Lond. Dub.*
c) OLEUM VOLATILE. *Dub.*

THIS tree is a native of North America, and is cultivated in Jamaica. It is the root which is commonly employed. It is brought to us in long branched pieces. It is soft, light, and of a spongy texture; of a rusty white colour; of a strong pleasant smell, resembling that of fennel; and a sweetish, aromatic, sub-acrid taste. The bark is rough, of a brownish colour on the outside, and ferruginous colour within; spongy and divisible into layers, and of a stronger taste and smell than the wood.

Neumann got from 480 grains, 80 of alcoholic, and afterwards 60 of watery extract, and inversely 120 watery, and 7.5 alcoholic. In distillation, alcohol elevates nothing, but water brings over a ponderous essential oil, in the proportion of about 10 from 480.

Med. use.—Sassafras, from the quantity of volatile oil it contains, is a gently stimulating, heating, sudorific, and diuretic remedy. It is best given in infusion. The decoction and extract are mere bitters, as the oil is dissipated by the preparation.

The essential oil may be obtained separate by distillation. It is of a whitish-yellow colour, and sinks in water. It is highly stimulating and heating, and must be given only in very small doses.

Off. Prep.—Oleum sassafras, *D. E. L.* Aqua calcis comp. *D.* Decoct. guaiaci comp. *D. E.* Decoct. sarsaparillæ comp. *D. L.*

LAVANDULA SPICA. *Ed. Lond. Dub.*

Willd. *g.* 1099, *sp.* 1. *Didynamia Gymnospermia.*—Nat. ord. *Verticillatæ*, Linn., *Labiatæ*, Juss.

Lavender †.

Off.—The flowers.

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* *Syn.* Laurier sassafras, (*Fr.*) Fenchelholzbaum, (*Ger.*) Sassafrasso, (*It.*) Cay-vang-du, (*Cochin-China.*) Sasafras, (*Arab.*)

† *Syn.* Lavande, (*Fr.*) Gemeiner Lavendel, (*Ger.*) Lavanda, (*It.*)

Flores. *Ed. Lond. Dub.*

There are two lavenders, one broad leaved and the other narrow leaved, which Linnæus united under the name of *L. spica*; but they are now considered, and with reason, as distinct species. Baron Gingens-Lassaraz, who has written a monography of the genus, retains the trivial name *Spica* for the broad leaved, and gives the title *L. vera* to the narrow leaved, which is the officinal species, and the only one cultivated in Britain.

Its flowers have a fragrant, agreeable smell, and a warm, bitterish, pungent taste. They are only used for its products by distillation. The quantity of oil obtained is very various. Hagen got from a pound of the recent flowers, sometimes two drachms, sometimes only half a drachm. The English oil of lavender is preferable to that imported from the Continent. This latter is probably adulterated by the oil of spike, got from the *L. spica*, which does not stand our climate. Oil of lavender has a sp. gr. of 0.8938. The oil of spike sold in this country is a mixture of oil of turpentine, some petroleum, and a little oil of lavender.

Med. use.—Lavender is a warm stimulating aromatic. It is principally used as a perfume.

Off. Prep.—Oleum lavandulæ, *D. E. L.* Spiritus lavandulæ, *D. E. L.* Spt. lavand. comp., *D. E. L.* Pulvis asari comp., *D. E.*

Leontodon taraxacum. *Ed. Lond. Dub.*

Willd. *g.* 1407, *sp.* 1; Smith, *g.* 344, *sp.* 1. *Syngenesia æqualis.*—Nat. ord. *Compositæ semiflosculosæ*, Linn., *Synantheræ*, sect. *Cichoraceæ*, Juss.

Common dandelion, Pissabed *.

Off.—The root and leaves.

a) Herba. *Ed.* Folia. *Dub.*

b) Radix. *Ed. Lond. Dub.*

This is a very common weed in gardens, grass fields, and uncultivated places. The leaves are annual; the roots fusiform, and perennial. It flowers from April to July. The whole plant contains a bitter milky juice, which, however, is most abundant in the roots before the flower-stem shoots.

The whole plant, root and leaves, are commonly used together, either recent or dried. By drying, they lose almost all their bitterness; the leaves lose two-thirds of their weight, and yield 125 alcoholic extract and 18 watery; the roots lose three-fourths of their weight by drying. The milky juice has been examined by John, who found it to contain bitter extractive, gum, caoutchouc, salts, a trace of resin and a free acid. The plant varies considerably in its virtues, according to circumstances. The juice, expressed from the root in spring and harvest, and carefully inspissated, becomes thick, of the consistence of honey, clear, of a reddish colour, and has a taste like extract of malt. The juice, expressed in summer, by inspissation becomes turbid, brown and bitter. When grown upon arid wastes, it contains more saline and bitter principles than when it grows in gardens and upon rich soils, and contains more of the saccharine principle, by virtue of which, the root, bruised with water, is capable of a certain degree of fermentation.

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* *Syn.* 'Αφάκη, (*Theoph.*) Αγριομαρῦλεια, (*Lacon.*) Pissenlit, Dent de lion, (*Fr.*) Lowenzahn, (*Ger.*)

Med. use.—The vulgar name of this weed, in many languages, shews a popular belief of its possessing diuretic properties. It has lately become a fashionable remedy in this country in some hepatic and dyspeptic complaints. It has been much longer used in Germany, and its effects more studied. It is there recommended as a deobstruent in venous congestions, in imperfect secretion from the liver, mucous membranes, especially of the alimentary canal, and in general in cases of debility of those membranes and organs which remains after they have been in a state of excitement. The decoction of two or three ounces of the young plant and root dried is taken daily in bilious and gastric fevers, in enlarged liver and spleen after agues, and in scirrhous diseases, especially of the pylorus. The inspissated juice, *mellago*, is given to the extent of 1–3 drachms three or four times a-day, with sulphate of magnesia, cream of tartar, or acetate of potass. Its use is contra-indicated by great debility and sensibility of the digestive organs, and when it causes eructation, flatulent distension and colic. It is also avoided when there is a tendency to diarrhœa, and it often requires volatile and aromatic correctives.

Dandelion is also one of the herbs, whose expressed juice enters into a course of spring physic; and it is an important ingredient in the visceral clysters, so much lauded by Kämpf. It may not be superfluous to subjoin the formula: R. Tarax. totius concisi, ℥iss; rad. saponariæ concis. ℥js. Coque ex aquæ xviij, ad colat. ℥xij. Sub finem coctionis adde Rad. valerian. concis., flor. chamom. vulgaris, ā ʒvi. Cola. This serves for two clysters, to be given daily, one before, and the other after the dejection.

Off. Prep.—Decoctum taraxaci, *D.* Extract. taraxaci, *D.*

LICHEN.

Murray, *g.* 1202. *Cryptogamia, algæ, lichenes.*

Sp. 50. LICHEN ISLANDICUS. *Lond. Ed.* CETRARIA ISLANDICA. *Dub.*

Iceland moss *. Eryngo-leaved liverwort.

Off.—The plant.

THIS is a perennial lichen, very common in Iceland, but also indigenous and found in the dry sterile woods of Switzerland and Germany, growing upon stones and on the earth. It has dry coriaceous leaves, divided into lobes and laciniæ, which are again notched and subdivided, with elevated margins, beset with short, very minute, rigid, parallel hairs, and marked with white spots, reddish towards the points. Amongst the leaves are found peltated, somewhat excavated, shining, viscid bodies, internally of a brown colour: these are the pericarpiums. Its colour is greenish-yellow, or greyish-brown; but when dried, greenish-white or grey. It has no smell, and its taste is mucilaginous, bitter, and somewhat astringent. By long chewing it dissolves in the mouth to mucilage. A variety is found, with smaller, tenderer, crisper leaves, destitute of hairs on the margin, of a paler lead colour, orange beneath. It is gathered in rainy weather, because it is then more easily detached from the stones. On being soaked in water it resumes its natural colour and weight, one pound increasing to two pounds two ounces. In three or four days it imparts to water a pale dun colour, but no taste. The powdered lichen gives speedily out to water a bitterness like succory, but does not lose more than 3 *per cent.* of its weight. It gives to an almost colourless solution of a persalt of iron a reddish-violet colour. Boiling water dissolves all its soluble principles.

According to the analysis of M. Proust, dried lichen gives of bitter extractive, 3; matter soluble in hot water, 33; matter insoluble in hot water, 64 = 100. The last substance has much analogy with gluten, and the second with starch, particularly in the remarkable property of being precipitated by infusion of galls. It differs from it, however, in not being glutinous, and in the solid matter of the jelly contracting and separating from the fluid, as curd does from whey.

Berzelius has examined it more recently. He got syrup 3.6; supernitrate of potass, tartrate and phosphate of lime, 1.9; bitter principle, 3.0; green wax, 1.6; gum, 3.7; extractive colouring principle, 7.0; lichen starch, 44.6, and amylaceous skeleton, 36.2 = 101.6. The bitter principle when purified is of a clear yellow colour, pulverulent, light, and of intense and durable bitterness. It is sparingly soluble in water, more so in alcohol, and very soluble in a solution of carbonate of potass. The lichen starch is also very soluble in the alkaline solutions, but its coagulability is so strong, that on cooling it separates from the solvent as the coagulum from the serum of the blood. When dried, after being dripped, it forms a black bone-hard mass, with a glassy fracture, swelling in cold water, but dissolving in boiling water, with the exception of the colouring matter, and now forming a white, but opaque coagulum. It has most analogy with sago starch, is not coloured blue by iodine, and is converted by long boiling with dilute acid into gum, and then into sugar, and by nitric acid into malic and oxalic, but not into mucic acid. It yields no ammonia.

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* *Syn.* Lichene d'Islande, (*Fr.*) Islandisches Moos, (*Ger.*) Lichene Islandico, (*It.*)

Med. use.—From the analysis of this lichen, it appears to consist principally of a nutritious substance, combined with a bitter; and on the combination of these, its dietetical medical virtues probably depend. It is used, in cough with expectoration, threatening to terminate in consumption; after neglected catarrhs, the consequence of peripneumony, when the expectoration becomes more copious and purulent: in emaciation from measles; from wounds and ulcers with great discharge; after salivation; and from actual ulcers in the lungs, when there is no fever; especially after neglected colds, or from translated morbid matter: in a high degree of the disease it does little good, but the night sweats are diminished by it: in pituitous phthisis it is of great service: in hæmoptysis: in chincough: in diabetes it is given as a tonic and palliative remedy.

It is commonly exhibited in decoction with water, broth, or milk, after the bitter has been extracted from it by steeping it in warm water; or in substance, boiled with chocolate or cocoa, or made into a jelly with boiling water. Half an ounce, or an ounce, must be used daily, and continued for some time. Proust disbelieves its specific virtues, but recommends it strongly as an article of diet in times of scarcity, and as a very convenient antiscorbutic vegetable in long sea-voyages. Its bitter taste is easily removed by soaking the ground lichen in a weak solution of potashes, and removing the liquor by compression and washing.

LIMON. *Dub. Lond.* See CITRUS.

LINUM.

Willd. *g.* 590; Smith, *g.* 163; Spr. *g.* 1148. *Pentandria Pentagynia.*—Nat. ord. *Gruinales*, Linn., *Linaceæ*, Juss.

Sp. 1. Willd. Smith. LINUM USITATISSIMUM. *Ed. Lond. Dub.*

Common flax *.

Off.—The seed.

SEMINA. *Ed. Lond. Dub.*

THIS valuable annual plant is said to have come originally from those parts of Egypt which are exposed to the inundations of the Nile. It is very extensively cultivated, and now grows wild in the south of England. It flowers in July, and the seeds ripen in September. The seeds are longish, egg-shaped, somewhat pointed at one end and blunted at the other, flat-compressed, brownish, very smooth, shining, with a sharp edge, and contain a white oily emulsive parenchyme. They have no smell, but an unpleasant, sweetish, slimy taste.

The chemical constitution of the covering is different from that of the cotyledons. The characteristic principle in the former is mucus, and of the latter a drying fixed oil. The mucilage is obtained by infusion or decoction. The oil is separated by expression. As it occurs in commerce, it is one of the cheapest fixed oils, but is generally rancid and nauseous, and unfit for internal use. The cake which remains after the expression of the oil contains the albuminous and mucilaginous part of the seed, and is used in fattening cattle, under the name of Oil-cake.

Med. use.—Linseed is emollient and demulcent. The infusion of the entire seeds is much employed as a pectoral drink, and in ardor urinæ, nephritic pains, and during the exhibition of corrosive sublimate. The meal makes an excellent cataplasm.

Off. Prep.—Oleum lini, *D. L. E.* Inf. lini comp. *D. E. L.* Pulvis pro cataplasmate, *D.* Cataplasma sinapis, *D. L.*

Sp. 26. Willd.; *sp.* 4. Smith; *sp.* 24. Spr. LINUM CATHARTICUM. *Dub. Lond.*

Purging flax. Mill-mountain.

Off.—Herba. The herb.

LINUM CATHARTICUM. *Lond.*
HERBA LINI CATHARTICI. *Dub.*

Syn. Λινον, (*Dios.*) Λινάϱι, (*Gr. Hod.*) Grains de lin, (*Fr.*) Leinsaamen, (*Ger.*) Seme di lino, (*It.*) Alleverei, Serroo sanulverei, (*Tam.*) Ulsikébinge, (*Duk.*) Buzruk, (*Arab.*) Tokhemkutān, (*Pers.*) Alivituloo, (*Tel.*) Bidgierāmmee, (*Mal.*) Tisi, (*Hind.*) Uma, (*Sans.*) Atasi, (*Sans. Hind.*) Pahaha, (*Hindooie.*)

This is an annual indigenous plant, which grows on dry meadows and pastures. It is about six inches in height; its stalks are slender formed, erect; its leaves small, oblong, oval, opposite, smooth; its flowers small and whitish. It flowers from June to August. It is extremely bitter. An infusion in water or whey of a handful of the fresh herb, or a dram of it in substance, when dried, is said to purge without inconvenience.

LITHARGYRUM. *Dub.* See PLUMBI OXYDUM SEMIVITREUM.

LYTHRUM SALICARIA. *Dub.*

Willd. *g.* 951; Smith, *g.* 223; Spr. *g.* 1763, *sp.* 1. *Dodecandria Monogynia.*—Nat. ord. *Calycanthemæ*, Linn., *Salicariæ*, Juss.

Purple-spiked Willowstrife, Loosestrife *.

Off.—The herb.

HERBA. *Dub.*

This perennial herbaceous plant is indigenous, and grows in marshes and on the banks of rivers. The stalk is upright, angular, somewhat rough, dichotomous; leaves sessile, amplexicaule, acuminate, roughish. The dried leaves have a herbaceous, somewhat astringent taste, and when moistened soon give out a ropy mucilage. Hence it is difficult to swallow the powder mixed with water.

Med. use.—The decoction of this plant has been long celebrated in Ireland in diarrhœas. In the same disease, it is a popular remedy in Sweden; and De Haen and Störck and others have given it with success in laxity of the intestines from an accumulation of sordes. After premising a purgative, a drachm or more of the powder may be given morning and evening, or three times a-day. Its properties are evidently mucilaginous and astringent.

LITMUS. *Dub.* See ROCELLA.

LIXIVUS CINIS, Anglice, **Potashes, Pearlashes.** *Dub.* See POTASSÆ SUBCARBONAS.

LYTTA VESICATORIA. *Lond.* 1809. See CANTHARIS.

MAGNESIÆ SUBCARBONAS. *Lond.*

Subcarbonate of magnesia.

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* *Syn.* Lysimachia purpurea, (*Off.*) Salicaire, (*Fr*) Rother Weidereich, (*Ger.*) Lisimachia, (*It.*)

This salt, for the preparation of which a formula is given by all the Colleges, is now also introduced into the materia medica by that of London, and with propriety, as it is never prepared by the apothecary himself.

In commerce, the greatest part of the carbonate of magnesia is made by mixing solutions of the muriate of magnesia and the subcarbonate of ammonia. The former of these salts is procured in a state of solution at the salt works, where it remains dissolved in the liquid in the pan after the muriate of soda has crystallized from the sea water. The subcarbonate of ammonia employed in the manufacture of carbonate of magnesia is used, either pure or impure, as it sublimes from soot or bones when they are exposed to a strong heat in a retort. The subcarbonate of ammonia is generally preferred to any other carbonate, because the ammonia may be recovered from the muriate of ammonia, which, as well as the carbonate of magnesia, is produced by the double decomposition of the muriate of magnesia and subcarbonate of ammonia. Though the most of the carbonate of magnesia is made in the manner now described, the purest is manufactured by mixing solutions of the subcarbonate of potass and muriate of magnesia, according to the formula of the Colleges.

Off. Prep.—Magnesia, *D. L. E.* Magnesiæ sulphas purum, *D.* Hydrargyrum cum magnesia, *D.*

MAGNESIÆ SULPHAS. *Ed. Dub.* s. s. Sulphas magnesiæ purificata. *Lond.*

Sulphate of Magnesia. Epsom Salt. Bitter purging salt.

THIS salt is contained in several mineral springs, and also in sea-water, from which it is obtained by evaporation. It crystallizes in tetrahedral prisms, has a very bitter taste, and is soluble in its own weight of water at 60°, and in three-fourths of its weight of boiling water. Sulphate of magnesia effloresces. By the action of heat it undergoes the watery fusion, and loses its water of crystallization, but does not part with its acid. It is decomposed by baryta, strontia, the alkalies, and all the salts formed by these salifiable bases, excepting the alkaline muriates; and by the nitrate, muriate, and carbonate of lime.

Med. use.—It is a mild and gentle purgative, operating with sufficient efficacy, and in general with ease and safety, rarely occasioning any gripes, sickness, or the other inconveniences of resinous purgatives. From one to eight drachms may be dissolved for a dose in a proper quantity of common water. The solution may likewise be so managed as to promote evacuation by the other emunctories; if the patient be kept warm, it increases perspiration; and by moderate exercise in the cool air, the urinary discharge. Some allege that this salt has a peculiar effect in allaying the pain of colic, even independently of evacuation. It has of late years almost superseded the use of sulphate of soda.

Off. Prep.—Magnesiæ carbonas, *D. L. E.* Pulvis salinus comp. *D. E.* Enema catharticum, *D.*

MALVA SYLVESTRIS. *Ed. Lond.*

Willd. *g.* 1290, *sp.* 43; Smith, *g.* 317, *sp.* 1; Spr. *g.* 2433, *sp.* 33. *Monadelphia Polyandria.*—Nat. ord. *Columniferæ*, Linn., *Malvaceæ*, Juss.

Common mallow [*].

Off.—The leaves and flowers.

a) HERBA MALVÆ SYLVESTRIS. *Ed.* MALVA. *Lond.*
b) FLORES MALVÆ SYLVESTRIS. *Ed.*

THIS is a perennial plant, common in Britain, under hedges, near footpaths, and among rubbish. The stem is erect and herbaceous, leaves seven-lobed, acute, with hairy peduncles and petioles; flowers, small, blue. It flowers from May to August.

The whole plant abounds with mucilage. The flowers are a delicate test of acid.

Med. use.—Decoctions of the leaves are sometimes employed in dysenteries, heat, and sharpness of urine, and in general for obtunding acrimonious humours. Their principal use is in emollient glysters, cataplasms, and fomentations.

MANGANESII OXYDUM. *Dub.*

Manganese; the black oxide of Manganese.

Manganese. Small whitish-grey globules; specific gravity 6.850; very hard and very brittle; very difficult of fusion; very oxidizable by exposure to air; decomposes water rapidly; is oxidized by the sulphuric and nitric acids; burns when strongly heated in oxygen or chlorine; combines with many metals. According to Berzelius, it forms a sub-oxide, containing two proportions of metal, $3.5=7$, and one of oxygen, $1=8$; three oxides, containing 1, 2, and 3 proportions of oxygen to one of metal, and two acids containing 4 and 5 proportions of oxygen to one of metal. These oxides colour glass brown, violet, or red, and destroy the colour of glass coloured by iron.

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[*] *Syn.* Μαλαχη χερσαια, (*Dios.*) Αγρια μολόχα, (*Hod.*) Mauve sauvage, (*Fr.*) Waldmalve, (*Ger.*) Malva silvatica, (*It.*)

Manganese is found, I. Metallic, native manganese: II. Oxidized, grey ore, containing its black oxide, 1. foliated grey ore; 2. radiated; 3. compact; 4. earthy: III. Sulphuretted, the black ore: IV. Carbonated, the red ore.

The varieties of the grey ore are the most common. It is found in greatest purity at Exeter, and at Howth near Dublin. It is chiefly used for destroying the colour which iron imparts to glass, and has hence been called Glass-maker's soap, and for preparing chlorine and chlorides. The application of these to the destruction of contagion, and to other medical purposes, has procured the black oxide of manganese a place in the list of the materia medica.

Off. Prep.—Aqua chlorini, *Dub.*

MANNA. Succus concretus Fraxini orni. *Lond. Dub. Ed.*

Manna, the concrete juice of the manna ash *.

THE tree which is indicated as yielding the officinal manna is the Μελια, (*Dios.*) *Fraxinus ornus.* Willd. *g.* 1908, *sp.* 15. *Polygamia Diœcia*; Spr. *g.* 128, *sp.* 1. *Diandria monogynia.*—Nat. ord. *Ascyrbideæ*, Linn., *Jasmineæ*, Juss. It is obtained from other species of *fraxinus* besides the *ornus*, and especially from the *rotundifolia.* It is principally collected in Calabria, Apulia, and Sicily. In the warmest season of the year, from the middle of June to the end of July, a clear juice exudes from the stem and branches of these trees, *Manna di spontana*, which, when naturally concreted on the plants, and scraped off, is called manna in the tear; but the manna of commerce is got only from incisions, *Manna forzatella.* If allowed to exude on straws, or chips of wood fastened to the tree, it is called canulated or flaky manna. The heat of the sun coagulates the frothy juice which exudes, and gives it the form of stalactites. The common or fat manna exudes in September and October, dries more slowly, and in larger masses, and is of a redder colour. The best manna is in oblong, light friable pieces or flakes, of a whitish or pale yellow colour, and somewhat transparent, having often a fibrous crystallization internally. It melts easily on the tongue, and has a sweet, somewhat sharp taste, not nauseous, or unpleasant, and a very weak not nauseous smell. The inferior kinds are moist, unctuous, and dark coloured.

Denon, in his Travels in Sicily, has given an account of the manna produced there, which is dearer than that of Calabria, and preferred to it, and is called *Manna Gerace.*

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* *Syn.* Manna canellata, (*Off.*) Manne canellée, (*Fr.*) Rohrenmanna, (*Ger.*) Manna in canoli, (*It.*)

Manna electa, (*Off.*) Manne en sorte, (*Fr.*) Kornige Manna, (*Ger.*) Manna in grani, (*It.*)

Manna is said to be sometimes counterfeited by a composition of sugar and honey, mixed with a little scammony: there is also a factitious manna, which is white and dry, said to be composed of sugar, manna, and some purgative ingredient, boiled to a proper consistence. This may be distinguished by its weight, solidity and transparent whiteness, and by its taste, which is different from that of manna.

Manna, by the application of flame, melts, boils, and burns with a blue flame, throwing out yellow sparks. It dissolves in water and in alcohol. A saturated hot alcoholic solution on cooling concretes into a perfectly dry, white, spongy, crystallized mass. When much less concentrated, it deposites a congeries of most beautiful snow-white acicular crystals. A saturated solution in boiling water also forms a solid crystallized mass on cooling.

According to Bucholz, it consists of mannite, 60; mucous sugar, (purging bitter principle? Gmelin,) 5.5; gummy extractive, 0.8; sweetish gum, 1.5; fibrous matter, 0.2; water and loss, 0.2. Thenard takes a little different view of its composition. He finds in it three principles, sugar, mannite, and an uncrystallizable nauseous principle. The sugar may be destroyed by carefully fermenting a solution of manna. The fermented liquor is evaporated to dryness, and treated by boiling alcohol, from which the mannite crystallizes, and the nauseous principle remains in solution. Mannite differs from sugar in its form of crystallization, and in not being susceptible of the vinous fermentation. Saussure makes it consist of carbon, 38.53; hydrogen, 7.47; and oxygen, 54.

Med. use.—Manna is a mild agreeable laxative, and may be given with safety to children and pregnant women: nevertheless, in some particular constitutions, it acts very unpleasantly, producing flatulency, and distention of the viscera: these inconveniences may be prevented by the addition of any grateful warm aromatic. Manna operates so weakly as not to produce the full effect of a cathartic, unless taken in large doses; and hence it is rarely given by itself with this intention. It may be commodiously dissolved in the purging mineral waters, or joined with the cathartic salts, senna, rhubarb, or the like.

Off. Prep.—Hydrargyrum cum magnesia, *D.* Hydrarg. cum creta, *D.* Electuarium cassiæ, *D. L. E.* Enema catharticum, *D.*

MARMOR ALBUM. *Lond.* See CALX.

MARRUBIUM VULGARE. *Ed. Lond. Dub.*

Willd. *g.* 1111; Spr. *g.* 2101, *sp.* 8; Smith, *g.* 270, *sp.* 1; *Didynamia Gymnospermia.*—Nat. ord. *Verticillatæ*, Linn., *Labiatæ*, Juss.

White horehound [*].

Off.—The leaves.

HERBA MARRUBII VULGARIS. *Ed.* MARRUBIUM. *Lond.* MARRUBIUM VULGARE. *Dub.*

THIS is a perennial herb, which grows wild on road-sides and among rubbish, and flowers in July. It has tetragonal stalks, with opposite petiolated leaves, and the whole plant is covered with a white pubescence. The leaves when fresh have a strong, rather agreeable vinous odour, becoming musky and balsamic when bruised; smell much weaker when dried. Their taste is bitter, saline, with acrimony, and durable. The leaves should be gathered before inflorescence.

Med. use.—It is considered as a tonic deobstruent, somewhat stimulating from the volatile oil which it probably contains. It is prescribed in atonic mucous fluxes from the respiratory and alimentary organs; in commencing phthisis catarrhalis, and in mucous hæmorrhoids. Half an ounce will furnish six ounces of decoction; and the extract may be given in doses of 19–60 grains.

MASTICHE. *Dub.* See PISTACIA.

MEL. *Lond. Dub. Ed.*

Honey [†].

ALTHOUGH most probably of vegetable origin, honey is not procured in any quantity except as an animal excretion from the bee (*apis mellifica.*) This industrious insect, during summer, flies from flower to flower, to collect the sweet juice secreted in them. When sufficiently loaded, it returns to its hive, where it deposites the honey, as a supply of winter's food, in the cells of the comb prepared of wax to receive it. What change the honey undergoes in the body of the insect is unknown; but it is certain that it varies very much, according to the nature of the plants from which it is collected.

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[*] *Syn.* Πρασιον, (*Diosc.*) Σκοῦλοχορτον, (*Hod.*) Marrube blanc, (*Fr.*) Weisser Andorn, Mariennepel, (*Ger.*) Prasine, (*It.*)

[†] *Syn.* Miel, (*Fr.*) Honig, (*Ger.*) Miele, (*It.*) Tayn, (*Tam.*) Shahid, (*Pers.*) Madhu, (*Sans.*) Ayermaddoo, (*Mal.*) Ussél ulnehl, (*Arab.*) Taynie, (*Tel.*) Meepanney, (*Cyn.*) Mudhoo, (*Hind.*)

Honey when recent is fluid, but by keeping gradually becomes drier, though never friable. It is subpellucid, and has a yellow colour, often with a reddish or brownish tint. Sp. gr. about 1.333; consistence, when recent, viscid, thick and smooth; when old, crystalline and granulated; smell agreeable, balsamic and various, according to the flowers from which it is collected; taste pleasant and very sweet, at last pricking the fauces; totally soluble in cold water, less soluble in alcohol.

The best honey is that which is freest from colour, and contains the largest grains when it concretes. For medical use, it should also be as free of flavour as possible. That obtained from young bees, and which flows spontaneously from the combs, is the purest and finest, and is known by the name of Virgin honey. When separated from the wax by expression, it is less pure; and there is another sort still inferior, obtained by heating the combs before they are put into the press.

Honey is often adulterated, or originally bad. When collected where fœtid flowers abound, as species of garlic, its smell is offensive. Genuine honey does not ferment spontaneously or mould. It is often mixed with water to increase its bulk. This is known by its thinness, and having no tendency to granulate. More commonly flour is added as well as water. This honey also granulates very imperfectly; but the adulteration is detected by dissolving it in cold water, when the flour subsides; still more certainly by tincture of iodine, which gives it a blue colour.

Honey consists principally of sugar, but it also probably contains mucilage and an acid, and is often impregnated with the essential oil of the flowers from which the bees have gathered it, as in the perfumed honey of the Crimea. In some parts of Asia and America, poisonous honey is met with, from the bees feeding on poisonous flowers. Neumann exsiccated honey in the water-bath; the vapour which arose, he says, took fire on the approach of a candle, and diffused its smell widely; and the liquor which was condensed was manifestly impregnated both with the smell and taste of honey, and amounted to three ounces, from eight of honey. Dissolved in water, honey undergoes the vinous fermentation, forming mead. Treated with alcohol, Proust says it may be separated into two kinds of sugar, one liquid, and the other crystalline. Cavellazzi obtained crystals from it, by saturating its acid with carbonate of lime. It is converted into oxalic acid by the action of nitric acid.

Med. use.—From the earliest ages, honey has been employed as a medicine. Besides the general properties of saccharine bodies, it possesses others peculiar to itself, probably depending on the presence of an acid. For internal use, sugar is commonly to be preferred, as honey, in some constitutions, produces gripes and colic pains. From its stimulus, however, it forms an excellent gargle, and facilitates the expectoration of viscid phlegm; and it is sometimes employed as an emollient application to abscesses, and as a detergent to ulcers. It is also preferable to sugar in forming electuaries, as it is not so apt to crystallize.

Off. Prep.—Mel despumatum, *D.* Mel rosæ, *D.* Oxymel, *D.* Confectio piperis nigri, *D.*

MELALEUCA LEUCADENDRON. *Ed. Dub.* MELALEUCA CAJUPUTI. *Lond.*

Willd. *g.* 1428. *Species nova. Polyadelphia Polyandria.*—Nat. ord. *Hesperideæ,* Linn., *Myrtineæ,* Juss.

The cajeput tree *.

Off.—The essential oil called Cajeput oil.

OLEUM VOLATILE. *Ed.* CAJUPUTI OLEUM, oleum essentiale. *Lond.* OLEUM VOLATILE CAJEPUT. *Dub.*

THE tree which furnishes the cajeput oil is frequent on the mountains of Amboyna, and the other Molucca islands. Drs Maton and Smith have lately examined specimens of this tree, which correspond with Rumphius, tab. 17, vol. ii.; and, as an unclassified species, have named it Melaleuca cajuputi. Fig. 2. most resembles the plate of Mr Colebrooke. The oil is obtained by distillation from the dried leaves, and is prepared in great quantities, especially in the island of Banda, and sent to Holland in copper flasks. As it comes to us, it is of a green colour, very limpid, lighter than water, of a strong camphoraceous smell, and has a strong pungent taste, like that of cardamoms. It burns entirely away, without leaving any residuum. It is liable to adulteration with oil of turpentine, flavoured with camphor, and coloured with the resin of milfoil. When rectified, it is colourless; but Mr Brande did not detect, in any of the specimens which he analyzed, copper, to which its colour used to be ascribed.

Med. use.—Like other aromatic oils, it is highly stimulating, and is principally recommended in hysteria, epilepsy, flatulent colic, and paralysis of the tongue. The dose is from one to four drops on a lump of sugar.

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* *Syn.* Le bois blanc, (*Fr.*) Der Kajaputbaum, (*Ger.*) Witteboom, Brandboom, (*Holl.*) Caju-Kelan, (*Java.*) Daun Kitsjil, (*Malay.*) Cay Flam, (*Cochin Ch.*)

It is applied externally, where a warm and peculiar stimulus is requisite; and is employed for restoring vigour after luxations and sprains; and for easing violent pain in gouty and rheumatic cases, in toothach, and similar affections.

MELISSA OFFICINALIS. *Ed. Dub.*

Willd. *g.* 1118; Spr. *g.* 2052, *sp.* 1. *Didynamia Gymnospermia.*—Nat. ord. *Verticillatæ,* Linn., *Labiatæ,* Juss.

Balm [*].

Off.—The herb.

FOLIA. *Ed.* HERBA. *Dub.*

BALM is a perennial herb, which grows wild on the Alps and Pyrennees, and is frequently cultivated in our gardens. It has a pleasant smell like citron, and a weak, roughish, aromatic taste.

Med. use.—It is principally used in the form of a watery infusion, which is drunk in the manner of tea.

MENISPERMUM COCCULUS. *Ed.* See COCCULUS SUBEROSUS.

MENTHA.

Willd. *g.* 1102; Spr. *g.* 2090; Smith, *g.* 262. *Didynamia Gymnospermia.*—Nat. ord. *Verticillatæ,* Linn., *Labiatæ,* Juss.

Sp. 7. Willd.; *sp.* 4. Spr.; *sp.* 3. Smith. MENTHA VIRIDIS. *Lond. Dub.*

Spearmint [†].

Off.—The plant.

MENTHA VIRIDIS. *Lond.* HERBA. *Dub.*

SPEARMINT is perennial, and a native of Britain. It flowers in August. The leaves have a warm, roughish, somewhat bitter taste, and a strong, not unpleasant, aromatic smell. Their virtues are stomachic and carminative.

Sp. 13. Willd.; *sp.* 8. Spr.; *sp.* 4. Smith. MENTHA PIPERITA. *Ed. Dub. Lond.*

Peppermint [‡].

Off.—The plant.

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[*] *Syn.* Μελισσοφυλλον, (*Dios.*) Melisse, (*Fr.*) Gemeine Melisse, (*Ger.*) Melissa, (*It.*)

[†] *Syn.* La menth à epi, (*Fr.*) Frauenmünze, (*Ger.*) Erba Santamaria, (*It.*)

[‡] *Syn.* Menthe poivrée, (*Fr.*) Pfeffermunze, (*Ger.*) Menta peperina, (*It.*)

MENTHA PIPERITA. *Lond.* HERBA. *Ed. Dub.*

THIS species of mint is also perennial, and a native of Britain, where it is cultivated in very great quantities, for the sake of its essential oil. It flowers in August and September.

The leaves have a strong, rather agreeable smell, and a pungent, aromatic taste, somewhat resembling that of pepper, and accompanied with a peculiar sensation of coldness.

Its predominant constituents are essential oil and camphor, both of which rise in distillation, and are combined in what is called Oil of Peppermint.

Med. use.—Peppermint is principally used as a carminative and antispasmodic. The distilled water is a domestic remedy for flatulent colic, and the essential oil is often given with advantage, in doses of a few drops, in cramps of the stomach.

Sp. 20. Willd.; *sp.* 28. Spr.; *sp.* 12. Smith. MENTHA PULEGIUM. *Ed. Lond. Dub.*

Penny-royal *.

Off.—The herb.

PULEGIUM HERBA. *Lond. Ed. Dub.*

THIS is also perennial, and a native of Britain. It flowers in September. In its sensible qualities it is warm, pungent, and aromatic, somewhat similar to spearmint, but less agreeable. It is seldom used.

MENYANTHES TRIFOLIATA. *Ed. Lond. Dub.*

Willd. *g.* 299, *sp.* 4; Smith, *g.* 84, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Rotaceæ*, Linn., *Gentianeæ*, Juss.

Buckbean, Marsh trefoil †.

Off.—The leaves.

MENYANTHES FOLIA. *Lond. Ed. Dub.*

THIS perennial plant is very common in marshy situations, and is one of the most beautiful of our native flowers. It flowers in June and July.

The leaves grow, by threes, on footstalks. They are excessively bitter, and their bitterness is extracted by infusion. They are said to be sometimes used in brewing ale, and that one ounce will go as far as half a pound of hops.

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* *Syn.* Γληχων, (*Dios.*) Γλυφόνι, βληχώνι, (*Hod.*) Menthe pouliot, Pouliot, (*Fr.*) Poleimunze, (*Ger.*) Puleggio, (*It.*)

† *Syn.* Trefle de marais, Trefle d'eau, (*Fr.*) Bitterklee, Dreyblättirige Zottenblume, (*Ger.*) Trifoglio palustre, (*It.*)

Med. use.—A drachm of them in powder purges and vomits. In infusion or extract, they have been recommended in intermittents, and in several cachectic and cutaneous diseases. The dose of the extract is from ten to twenty grains.

MEZEREON. *Dub.* See DAPHNE.

MOMORDICA ELATERIUM. *Lond. Dub.*
Monœcia Syngenesia. Willd. *g.* 7139, *sp.* 13.—Nat. ord. *Cucurbitaceæ,* Linn. Juss.

Wild cucumber. Squirting gourd.

Off.—The fresh fruit; the leaves; Elaterium.

a) ELATERII PEPONES. Pepones recentes. *Lond.* FRUCTUS. *Dub.*
b) ELATERIUM. *Ed.* FÆCULA. *Dub.*
c) FOLIA. *Dub.*

THIS plant is a native of the south of Europe, and is perennial. When cultivated in this country it does not survive the winter. The fruit is oblong, about an inch and a half long, and an inch in diameter. It is of a green colour, and beset with stiff hairs. When nearly ripe, it bursts on a slight touch, separates from its stalk, and sheds its seeds, and the juice in which they are imbedded, with great force. From this circumstance it was named by the Greeks *Elaterium,* which name was also applied to their only officinal preparation, and in that sense it is now used by the Edinburgh College.

Dr Clutterbuck has ascertained that the active principle of wild cucumber is contained almost exclusively in the juice around the seeds, and that genuine elaterium is the matter which subsides spontaneously from this juice obtained without pressure. From forty cucumbers Dr Clutterbuck obtained only six grains; and as an eighth of a grain seldom fails to purge violently, a single cucumber contains about an ordinary dose. The juice, after the fecula has subsided, contains very little of the active principle, five grains seldom producing any effect. The other parts of the fruit, the leaves, stalks, and root of this plant, are also nearly inactive. Of Dr Clutterbuck's elaterium, Mr Barry found that the eighth part of a grain thus prepared seldom failed to purge violently, and of this, according to the experiments of Mr Barry, from 55 to 64 *per cent.* were soluble in alcohol of 0.809. The chemical constitution of the elaterium of British commerce has been investigated by Dr Paris, assisted by Mr Faraday. Alcohol of 0.817 dissolved only 16 *per cent.* and water afterwards 56; inversely water first applied dissolved 40, alcohol afterwards only 5 *per cent.* His results are water 4, extractive 26, fecula (starch) 28, gluten 5, woody matter 25, *elatine* and bitter principle 12. The bitter principle is not in itself purgative, but quickens the action of the elatine when combined with it. Elatine he considers as a new principle, of a green colour, soft, considerably heavier than water, not in the least bitter, inflammable, and burning with smoke and an aromatic odour, insoluble in water, soluble in alcohol, forming a beautiful green solution, from which it is precipitated by water, and soluble in alkalies. In very minute quantities it purges.

This analysis deserves to be repeated on a larger quantity of the substance, as it was performed on ten grains only, which is much too little to furnish conclusive results. The observations of Dr Clutterbuck are, however, sufficient to enable us to appreciate the comparative value of the British and French methods of preparing elaterium. According to the former, the juice is rejected, and the fecula is the elaterium; and by the latter the fecula is rejected, and the dried juice is the elaterium. This explains why the continental elaterium requires to be given in doses which would be dangerous with that of this country.

Med. use.—The wild cucumber was much used by the ancients, who regarded every part of the plant as purgative, but it appears erroneously. It is probable that the ancients gave the name of *elaterium* to different substances, and that by this term Hippocrates understood all violent purgatives. Dioscorides extols excessively this fruit for its great efficacy in madness and melancholy. Its use has been revived in this country chiefly by the recommendation of Dr Ferriar, who extolled the use of what he called a *farrago* in which it was an ingredient, as succeeding in dropsies after other remedies had failed. I have often prescribed elaterium alone, and I find that half a grain or a grain acts as a certain drastic hydragogue purge, and that it is exceedingly apt to produce watery vomiting at the same time. I have generally given it in pills containing the quarter of a grain, to enable me to suit the dose to the patient. Solution is evidently a less fit form.

The powder of the dried leaves has been used in Dublin. Our trials do not confirm the reports of their efficacy.

Off. Prep.—Extractum elaterii, *L. D.*

MOSCHUS. *Ed. Dub.* Concretum sui generis. *Lond.*
Musk.

THE musk[*] animal, *Moschus moschiferus*, is an inhabitant of the most elevated regions of Asia, between 16°—58° N. L. and 92°—155° E. long. In Siberia, it is found on the range of the Altayan chain of mountains, from the river Obi to the Lena; also in Cashmire, Thibet, Bootan, China, Tonquin, Cochin-China, Pegu and Arracan. It is caught in pits or traps, or is shot with arrows. In the male, about five lines behind the navel, and 1 or $1\frac{1}{2}$ lines before the penis, is situated the musk bag, which is of a lenticular form, in length from 2 to $2\frac{1}{2}$ inches; $1\frac{1}{4}$ to $1\frac{3}{4}$ in breadth, and $\frac{1}{2}$ to $\frac{3}{4}$ inches deep. One surface is covered with short rigid hairs of a fawn colour, like those of a deer, and the other is dark brown and membranous, totally without hairs, having been dissected from the abdominal muscles. In the drawing published by Brandt and Ratzeburgh, the membranous side is flat, and the hairy convex. In my specimen it is the reverse, probably owing to the mode of drying. On the hairy surface are two small openings; the one posterior, not communicating with the interior of the bag, serving for the protrusion of the penis in its erect state, and surrounded by bristly hairs; the other anterior, being the mouth of a short duct, by which the musk is expressed, and around its interior orifice there are some fine matted long hairs. The inner surface of the bag is of a reddish, yellowish-brown colour. The musk itself, with which it is filled, in its recent state has the consistence of an electuary, of a reddish-brown colour, but by keeping it becomes dry and crumbly.

There are two sorts of musk in commerce. The best comes from China, and is called Tonquin, Thibet, or Oriental musk. It occurs in bags, of a rounder shape, covered with brown-yellow or reddish-brown hairs, lined with a single fine membrane, and containing at the most $1\frac{1}{2}$ drachm of a large grained musk, of a black-brown colour, and a strong ammoniacal smell. An inferior kind comes from Siberia, and is called Siberian, Russian or Cabardine musk. The bags are longer, larger. About twenty-six weigh a Russian medical pound, covered thickly with hair, and filled with a small-grained, pulverulent, clear yellow-brown, of a weaker and more fœtid smell, like castor, or horses' sweat, with little ammoniacal odour.

On account of its high price, musk is often adulterated. When purchasing it in bags, we must see that they have not been opened to abstract part of their contents, and increase their weight by foreign admixtures. Also bags altogether false are imposed upon the ignorant. I have two which came direct from Thibet, which are nearly globular, hairy over their whole surface, and seem to me to be the scrotum of the musk animal itself, from which the testicles have been extracted, and the empty skin filled with an imitation of musk, in which the odour of cinnamon is very evident. Musk in grains is still more liable to adulteration. It should have a dark brown, or dark rust-brown colour, and not feel gritty when chewed or rubbed upon paper with the blade of a knife, but shew a few resinous points, and acquire a brighter yellow colour. Its smell when concentrated is rather ammoniacal, but when dilute peculiar and fragrant, but apt to produce headach and vertigo with many persons. Its taste is somewhat acrid and bitter. When laid on hot iron, or burnt in the focus of a lens, it leaves little ashes.

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[*] *Syn.* Le musc, (*Fr.*) Das Bisam, (*Ger.*) Il muschio, (*It.*) Tabarga, (*Siber.*) Kabarga, (*Russ.*) Xe, Hiang-tcheroy-tse, (*Chin.*) Mishk, (*Duk. Pers. Arab.*) Castoori, (*Tam. Tel. Sans.*) Jebat, (*Mal.*) Dedas, (*Jav.*) Kastowrie, (*Hindooie.*) Rutta oorroola, (*Cyng.*)

Musk has been frequently analyzed. Neumann got from thirty grains of musk twelve of watery and four of alcoholic extract; and inversely, ten of alcoholic, and six of watery. Its smell and taste were elevated in distillation with water, but not with alcohol. Neither the fixed nor volatile oils dissolve it.

According to Theimann, good musk contains from 10 to 15, and according to Blondeau and Guibourt 47 *per cent.* of volatile matter. This is considered by some to be entirely ammonia, but by others to consist of ammonia and volatile oil, and is the characteristic principle of good musk. Of matter soluble in water, Theimann got 81 *p. c.*, and from exsiccated musk 90. Buchholz from 70–85, Wetzler 55, and Buchner only 54.5. Of matter soluble in alcohol, Buchner got 62; Theimann 50; Wetzler 27, and Buchholz 25. The principle soluble in water has acid re-action.

Med. use.—Musk is still believed by some to be a medicine of very great efficacy. According to them, properly administered, it sometimes succeeds in the most desperate circumstances; it raises the pulse, without heating much; allays spasms, and operates remarkably on the brain, increasing the powers of thought, sensation, and voluntary motion.

It may be employed in the last stage of typhus fever, especially when attended with delirium, or spasmodic affection of any particular organ, or of the whole system, or subsultus tendinum, &c. It is also used with benefit in exanthematous and phlegmonic diseases, accompanied with typhoid fever; and in many spasmodic affections, as chincough, epilepsy, trismus, &c.

It is most conveniently given in substance in powder, in doses of three grains or upwards, repeated every one or two hours. Its best preparation is the tincture.

Off. Prep.—Tinctura moschi, *D.* Mistura moschi, *L.*

MOXA. *Dub.* See ARTEMISIA.

MYRISTICA MOSCHATA. *Ed. Lond. Dub.*

Willd. *g.* 1351, *sp.* 1. *Monœcia Monandria*; Spr. *g.* 2382, *sp.* 1. *Monadelphia Octandria.*—Nat. ord. *Oleraceæ*, Linn., *Myristiceæ*, Juss.

The nutmeg tree.

Off.—Nutmeg; oil of nutmeg; oil of mace.

a) NUCLEUS MYRISTICÆ MOSCHATÆ. *Ed.* NUCLEI MYRISTICÆ. *Lond.* NUCES MOSCHATÆ. *Dub.*

b) INVOLUCRUM NUCLEI, *vulgo* MACIS. *Ed.* Involucrum, dictum MACIS. *Dub.*

c) OLEUM ESSENTIALE NUCIS MOSCHATÆ. *Dub.*

d) OLEUM EXPRESSUM. *Dub. Lond.*

THE tree which furnishes this elegant spice is a native of the Molucca islands, and is cultivated in Banda, from which all Europe has been hitherto supplied with mace and nutmeg. The entire fruit, or drupe, is about the size of a peach, and is marked with a longitudinal furrow. The external covering is smooth, fleshy and bitter. As the fruit ripens, this bursts, and discloses the mace, which is the arillus, appearing as a soft membrane, divided into narrow branched slips, very unctuous, of a dark red colour, and aromatic flavour. Within the mace is inclosed the nut, which consists of a brown, thin, hard shell, and a fatty parenchymatous kernel, of an oval shape. The fruit is gathered three times a-year. The external covering is separated on the spot, and the mace and nut carried home, where they are carefully dried in the sun. After they are dried, the nutmegs are dipt in lime water, and the mace is sprinkled with salt water, probably to preserve them from the attacks of insects.

Mace *, by drying, acquires a reddish-yellow colour. When good, it is flexible, thin, oily, of a deep colour, has a strong agreeable smell, and an aromatic, bitterish acrid taste. When brittle, divided into fewer slips, of a whitish, or a pale yellow colour, and of little smell or taste, it is to be rejected.

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* *Syn.* Macis, (*Fr.*) Moskatblumen, (*Gr.*) Mace, (*It.*) Jadiputrie, (*Tam.*) Jawatrie, (*Hind. Duk.*) Bunga-bua-pala, (*Mal.*) Kambang-pala, (*Javan.*) Bunga-pali. (*Bali.*) Jatipatri, (*Sans.*) Wassawasie, (*Cyng.*) Bezbaz, (*Pers.*) Talzuffer, (*Arab.*)

Neumann got from 7680 parts of mace 300 of volatile oil heavier than water, on which its flavour depends. Mace also yields an expressed oil less consistent than that of nutmegs. Mace was analyzed by M. Henry, who got a volatile oil in small quantity; a fixed oil, odorous, yellow, soluble in ether, but not in boiling alcohol; a fixed oil, odorous, red, soluble in ether and alcohol in all proportions; a peculiar gummy matter analogous to amydine, constituting about one-third of the whole, and lignine in small quantity.

Nutmegs * are oval, flattened at both ends, of a grey-brown colour, and reticularly furrowed on the outside, of a yellow colour within, variegated with brown undulating lines, solid, hard, unctuous to the feel, and easily cut with a knife, and have a balsamic smell, and agreeable aromatic taste. The small round nutmegs are better than the large oval ones. They should have a strong smell and taste, and should neither be worm-eaten, musty, nor variegated with black lines. Their activity is, however, confined to the dark-coloured veins, which are not apt to be worm-eaten.

Bonastre got stearine, 120; elaine, 38; volatile oil, 30; acid, 4; fecula, 12; gum, 6; lignine, 270; loss, 20 = 500.

Volatile oil of nutmeg.—By distillation nutmegs yield a considerable quantity of essential oil, of a whitish-yellow colour, lighter than water, and possessing the aromatic taste and smell in an eminent degree. In doses of a few drops, it is a powerful carminative and stomachic.

Expressed oil of mace.—Nutmegs also yield by expression a considerable quantity of limpid yellow oil, which, on cooling, acquires a sebaceous consistence. They are first beaten to a soft paste in a warm mortar, then inclosed in a linen bag, exposed to the vapour of hot water, and squeezed in a press, of which the plates have been heated. It is a mixture of the volatile oil on which the flavour depends, and of a fixed oil, of a white colour, without taste or smell; and as the properties which characterize it depend on the presence of the volatile oil, the denomination of Fixed oil is less correct than that of Expressed oil, given from the manner of its preparation. 500 parts of nutmeg yield from 56 to 60 of expressed oil; and 18 parts of expressed oil yield about one of volatile oil.

In the shops we meet with three sorts of unctuous substances called Oil of mace, though really expressed from the nutmeg. The best is brought direct from the East Indies, in stone jars. This is of a thick consistence, of the colour of mace, and of an agreeable fragrant smell. The second sort, which is paler coloured, and much inferior in quality, comes from Holland, in solid masses, generally flat, and of a square figure. The third, which is the worst of all, and usually called Common oil of mace, is an artificial composition of suet, palm oil, and the like, flavoured with a little genuine oil of nutmeg. 7680 of the second sort yielded to Neumann 330 volatile oil heavier than water, 2880 of fluid expressed oil, and 4560 of solid but fusible sebaceous matter, perfectly insipid, inodorous, and of a chalky whiteness.

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* *Syn.* Noix muscade, (*Fr.*) Muskatennusse, (*Ger.*) Noce moscada, (*It.*) Jādicāi, (*Tam.*) Jaephal, (*Hind.*) Jatiphala, (*Sans.*) Jayaphala, (*Beng.*) Jatipullum, Sadikka, (*Cyng.*) Jāphul, (*Duk.*) Jouz bewa, (*Pers.*) Jowzalteib, (*Arab.*) Jāiphul, (*Hindooie.*) Buah-pala, (*Mal.*) Woh pala, (*Jav.*) Bu-wah pa, (*Bali.*) Jājikina, (*Tel.*) Gasori, (*Ternate.*) Japhal, (*Mal.*)

Med. use.—Both mace and nutmegs are rather to be considered as aromatic spices, than as articles of medicine. From the essential oil they contain, they are heating and stimulating; and they are added to other medicines for the sake of their agreeable flavour.

Off. Prep. of nutmeg.—Spiritus nucis moschatæ, *D. L. E.* Spt. ammoniæ aromat., *D.* Spt. armoraciæ comp., *D.* Spt. lavandulæ comp., *D. L. E.* Confectio aromatica, *D. L.* Electuarium catechu, *E.* Trochisci carb. calcis, *E.*

Off. Prep. of the expressed oil.—Emplast. picis comp., *L.*

MYROXYLON.

Willd. *g.* 829. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ*, Linn., *Leguminosæ*, sect. *Papilionaceæ*, Juss.

Sp. 1. MYROXYLON PERUIFERUM. *Ed. Lond. Dub.*

Peruvian balsam [*].

Off.—BALSAMUM. *Dub. Ed.* BALSAMUM PERUVIANUM, *Dub.*

Sp. . MYROXYLON TOLUIFERUM. Kunth. *Myrospermum Toluiferum.* Spr. *Toluifera balsamum. Ed. Lond. Dub.*

Balsam of Tolu [†].

BALSAMUM. *Ed.* RESINA. *Dub.* BALSAMUM TOLUTANUM. *Lond.*

I HAVE united these two balsams together, because it is doubtful whether the trees yielding them are distinct species or varieties from difference of situation. Ruiz expressly considers them as the same; and says, that the balsam of quinoquino is procured by incision at the beginning of spring, is collected in bottles, where it keeps liquid for some years, called *White liquid balsam;* when it is deposited in mats or calibashes, after some time it condenses and hardens into a resin, *Dry white balsam,* or Balsam of Tolu. It is generally believed, that if an extract be made from the bark by boiling it in water, it remains liquid, and of a blackish colour, *Black Peruvian balsam.* "There is no difference in these three balsams, excepting in the name, colour and consistency." Sprengel also, in a memoir on the subject, considered them to be the same, and ascribed their difference to the one being produced in Peru under the equator, and the other in New Granada, 150 geographical miles further north. In his later *Species Plantarum,* he has however made them different species, as had previously been done in Humboldt's Novæ Species.

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[*] *Syn.* Baume de Perou, (*Fr.*) Peruvianische Balsam, (*Ger.*) Balsamo del Peru, (*It.*)

[†] *Syn.* Baume de Tolu, (*Fr.*) Tolutanische Balsam, (*Ger.*) Balsamo del Tolu, (*It.*)

The Peruvian balsam tree grows in the warmest provinces of South America. It was described by Hernandez under the native name of Hirtziloxitl, and by Piso, under that of Cabureiba. Notwithstanding what is already stated on the authority of Ruiz, the mode of obtaining it is not ascertained. The Berlin Pharmacopæia states, that it is procured by burning the wood, that is by a kind of distillation *per descensum,* as tar is prepared; while others think that it is got by incision, or by decoction. It is brought in tin flasks, and generally has a portion of a watery fluid on the surface, and a considerable deposit, which is soluble in it by heat, but again separates on cooling.

Peruvian balsam is a fluid about the thickness of a syrup, of sp. gr. 1.14 to 1.15, which does not dry from exposure to the air, of a dark brown-red colour, perfectly transparent in a single drop, of the smell of vanille, and having at first a mild bitterish aromatic taste, but afterwards causing a pricking sensation on the tongue and in the fauces, and burns rapidly on a wick with much smoke. Stolze got, on analysis, of a difficult soluble brown resin, 24; of an easily soluble brown resin, 207; oil, 690; benzoic acid, 64; extractive, 6; water and loss, 9 = 1000.

Med. use.—Balsam of Peru is a very warm aromatic medicine, considerably hotter and more acrid than copaiva. Its effects are stimulating and tonic. Hence its use in some kinds of asthmas, gonorrhœas, dysenteries, suppressions of the uterine discharges, and other disorders proceeding from debility. It is also employed externally for cleansing and healing wounds and ulcers, and sometimes against palsies and rheumatic pains.

Balsam of Tolu occurs in commerce in small gourd shells, of a brownish-yellow, or reddish-brown, friable, resinous substance, of a very pleasant smell, like vanille or benzoin, and of a weak aromatic, somewhat acrid taste. It softens under the fingers, and melts readily. It is perfectly dissolved in six parts of alcohol, combines easily with volatile oils, and more difficultly with expressed oils. According to Trommsdorff, it contains, in 100 parts, 88 of resin, 12 of benzoic acid, and 0.2 of volatile oil.

Its adulteration with turpentine or resin is known by its smell when thrown on hot coals.

Med. use.—It agrees in every respect with the other balsams, and especially with the balsam of Peru.

Off. Prep.—Tinctura balsami tolutani, *D. E.* Tinct. benzoes comp. *D. L. E.* Syrupus tolutanus, *L. E.*

MYRRHA, gummi-resina. *Dub. Ed.* Arboris nondum descriptæ gummi-resina. *Lond.*

Myrrh *.

The tree which produces the myrrh has at last been ascertained by Ehrenberg, and has been described by Nees von Esenbeck, in his work on officinal plants, under the title of *Balsamodendron Myrrha.* In the sexual system it belongs to *Octandria monogynia*, and in the natural arrangement to the *Terebinthaceæ.* It is very nearly allied to the *Amyris Kataf* of Forskahl, which is now referred to the genus Balsamodendron. It grows in the province of Gison, on the borders of Arabia Felix. Ehrenberg saw very fine myrrh collected from the bark of this tree. It flows at first oily, then becomes butyraceous, yellowish-white, gradually gold coloured, and red when dry. It exudes in the manner of our cherry gum, and with age (of the tree?) becomes darker coloured, blacker and coarser.

The best myrrh is in the form of tears, of a yellow or reddish-yellow colour, becoming redder when breathed on; light, brittle, of an unctuous feel, pellucid, shining; presenting white semicircular striæ in their fracture; of a very bitter aromatic taste, and a strong, peculiar, not unpleasant odour. It is not good if whitish, dark coloured, black, resinous, ill smelled, or mixed with impurities.

Neumann ascertained that water and alcohol are both of them capable of taking up the whole of the taste and smell of myrrh, the extract made by either after the other being insipid. The alcohol distilled from the tincture elevated none of the flavour of the myrrh; but during the inspissation of the decoction a volatile oil arose, containing the whole of the flavour of the myrrh, and heavier than water, while the extract was merely bitter. From 7680 parts of myrrh, he got 6000 watery extract, 180 volatile oil, and 720 alcoholic; and inversely, 2400 alcoholic, and 4200 watery. Myrrh is not fusible, and is difficultly inflammable. Mr Hatchett found it soluble in alkalies.

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* *Syn.* Myrrhe, (*Fr. Ger.*) Mirra, (*It.*) Valatipolum, (*Tam.*) Palendra bolum, Villey bolum, (*Tam.*) Balintra bolum, (*Tel.*) Vola, (*Sans.*) Heera bol, (*Duk.*) Bowl, (*Hind.*) Murr, (*Arab.*) Manisan lebah, (*Malay.*) Madu, (*Jav. Bali.*)

The most complete analysis of myrrh is by Brandes. He obtained of volatile oil, 13; balsamic resin, 111.2; resinoid, only soluble in alcohol, 27.8; gum with traces of benzoate and other salts of potass and lime, 271.92; tragacanthine, 46.83; vegeto-animal with saline matter, 3; salts of potass and lime, 3.75; foreign admixtures, 8; water, 17.8=502.5. The volatile oil partly swam, and partly sank in water; but the former also soon sank, its white colour being at the same time changed into yellow.

Med. use.—Myrrh is a heating stimulating medicine. It frequently occasions a mild diaphoresis, and promotes the fluid secretions in general. Hence it proves serviceable in cachectic diseases arising from inactivity of the system, and it is supposed to act especially upon the uterine system, and to resist putrefaction.

It is exhibited, in substance, in the form of powder, or made up into pills, in doses of 10 to 60 grains; dissolved in water, as in Griffith's celebrated myrrh mixture; or dissolved in alcohol.

Off. Prep.—Tinctura myrrhæ, *D. E. L.* Pilulæ aloes cum myrrha, *D. L. E.* Pilulæ ferri comp., *D. L.* Pilulæ galbani comp., *D. L.* Decoctum aloes comp., *D.* Mistura ferri comp., *D.* Tinctura aloes et myrrhæ, *E.* Tinct. aloes etherea, *E.* Pilulæ assæfœt. comp., *E.* Pil. rhei comp., *E.*

MYRTUS PIMENTA. *Ed. Lond. Dub.*

Willd. *g.* 973, *sp.* 28; Spr. *g.* 1822, *sp.* 89. *Icosandria Monogynia.*—Nat. ord. *Hesperideæ*, Linn., *Myrtineæ*, Juss.

Pimento tree *.

Off.—The fruit, commonly called Jamaica Pepper.

FRUCTUS. *Ed. Dub.* BACCÆ PIMENTÆ. *Lond.*

THIS is a native of Jamaica, and grows in all the woodlands on the north side. Soon after the trees have blossomed, the berries become fit for gathering, without being suffered to ripen, as when ripe they are moist and glutinous, and therefore difficult to preserve, and when dried become black and tasteless. The berries are dried by spreading them on a terrace, exposed to the sun for about seven days, during which time they gradually lose their green colour, and become of a reddish-brown.

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* *Syn.* Toute-epice, Piment, Poivre de la Jamaique, (*Fr.*) Nelkenpfeffer, (*Ger.*) Pepe garofanato, (*It.*)

The smell and taste of this spice resemble a mixture of cinnamon, cloves, and nutmegs, whence it has received the name of *All-spice.*

Neumann ascertained that its flavour resides entirely in a volatile oil, heavier than water, and its pungency, in a substance soluble in alcohol, and insoluble in water. From 480 parts, he got 120 watery extract, 30 volatile oil, and 20 alcoholic extract; and inversely, 66 alcoholic, and 100 watery.

Pimento has also been analysed by Braconnot, and still more minutely by Bonastre. He got from 1000 parts of the berries, from which the seeds had been removed, of volatile oil, 100; green oil, 80; white flocculi, 9; astringent extract, 114; gummy extract, 30; yellow principle, soluble in alkali, 40; resin, soluble in alcohol and ether, 12; granular sugar, 30; malic and gallic acids, 6; water, 35; lignine, 500; salts, 28; loss, 100. From the seeds alone, he got volatile oil, 50; green oil, 25; brown flocculi, 32; astringent matter, 398; brick red principle, insoluble in water, 88; mucous extract, 75; white flocculi, 12; honey-sugar, 80; gallic and malic acids, 16; water, 30; husks, 19; loss, 18=100. The green oil was the acrid principle.

Med. use.—Pimento is a warm aromatic stimulant, and is much used as a condiment in dressing food. As a medicine, it is advantageously substituted for the more costly spices, especially in hospital practice.

Off. Prep.—Oleum pimentæ, *D. L. E.* Aqua pimentæ, *L. E. D.* Spiritus pimentæ, *L. E. D.* Pilulæ opiatæ, *E.* Syrupus rhamni, *L. D.*

NICOTIANA TABACUM. *Ed. Lond. Dub.*

Willd. *g.* 379, *sp.* 1; Spr. *g.* 651, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ,* Linn. Juss.

Tobacco *.

Off.—The dried leaves.

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* *Syn.* Tabac, (*Fr.*) Taback, (*Ger.*) Tabacco, (*It.*) Poghey ellei, (*Tam.*) Tumbaka, (*Hind. Duk.*) Bujjerbang, (*Arab.*) Tabaco, (*Japan.*) Doonkola, (*Cyn.*) Poghaku, (*Tel.*) Dhumnapatra, (*Sans.*) Tambracoo, (*Mal.*) Tambrocoo, (*Jav. Bali.*) Tamen, (*Tart.*) Quauryetl, (*Mexican.*) Sang-yen, (*Chin.*)

Folia. *Ed. Dub.* Folia exsiccata Virginiana. *Lond.*

Tobacco is an annual plant, a native of America, from whence it was brought into Europe about the year 1560. It is sometimes cultivated in our gardens, but for general use is imported from Virginia in large quantities. The leaves are about two feet long, of a pale green colour while fresh, and when carefully dried they have a yellowish tint. They have a strong, disagreeable, narcotic smell, and a very acrid burning taste.

The active constituent of tobacco was supposed to be an essential oil; for, by long boiling, the decoction and extract of tobacco become almost inert; and by distillation, an oil is obtained from it, so active, that small animals are almost instantly killed, when wounded by a needle dipped in it.

Vauquelin has analysed tobacco, both in its fresh and prepared state. The expressed juice is manifestly acid, and contains a great quantity of albuminous matter, super-malate of lime, acetic acid, nitrate and muriate of potass, muriate of ammonia, a red matter soluble in alcohol and in water, which swells and becomes charred by heat, and an acrid principle, *nicotine*, on which its peculiar properties depend. As the principle was not perfectly isolated by Vauquelin, a new examination was undertaken by Hermbstaedt. He infused six pounds of dried tobacco, cut small, in six times its weight of water, and drew off one-third. The distilled water was turbid, neither acid nor alkaline; tincture of nut-galls produced white flocculi, soluble in acids and alkalies. By exposure in a loosely covered vessel, the water became clear, and on the surface a white, foliated, crystalline substance collected. This was called *Nicotianine.* It is easily fusible; equally soluble in alcohol and in water; is volatile, and diffuses a smell like that of the finest tobacco. Its action upon the animal economy is powerful. When tasted, it produces a peculiar stimulus in the mouth and fauces, like that of tobacco; and very little applied to the nostrils causes sneezing. A grain swallowed caused vertigo, nausea and retching. It is the nicotianine which is agreeable in the smoking of tobacco, but its flavour is deteriorated by the empyreumatic oil mixed with it.

Med. use.—On the living body, whether taken into the stomach in substance or solution, or into the lungs in the form of smoke, or applied to abraded surfaces, tobacco is capable of producing deleterious effects. It often proves virulently cathartic or emetic, and occasions intolerable cardialgia, anxiety and vertigo.

The system becomes easily habituated to the action of tobacco; and many people use very large quantities of it in several ways as a luxury, without experiencing any other bad effect than what arises from their being unable to relinquish the habit after it is confirmed.

As a medicine, it is exhibited in various forms: 1. In substance. When chewed, it causes an increased flow of saliva, and sometimes relieves the toothach; and reduced to powder, it proves an excellent errhine and sternutatory when snuffed up the nostrils. 2. In infusion in water or wine: Taken in such small doses as to have little effect on the stomach, it proves powerfully diuretic, and was employed by Dr Fowler, with very great success, in cases of dropsy and dysuria. An infusion of not more than 30 grains in ℥ xii. of boiling water is often used as a clyster, half being given at a time, in obstinate constipation, ileus, and incarcerated hernia; and it has been recommended in all cases where it is an object to reduce the vital powers. The infusion is also applied externally for the cure of psora, tinea, and other cutaneous diseases. 3. In the form of smoke, it is injected into the anus by means of a bellows of a peculiar construction. By acting as a stimulus to the rectum, it sometimes succeeds in reviving the vital powers in some kinds of asphyxia, and in evacuating the intestines in cases of obstinate constipation.

Off. Prep.—Infusum tabaci, *L. D.* Vinum tabaci, *E.*

NITRUM. *Dub.* See POTASSÆ NITRAS.

NUX MOSCHATA. *Dub.* See MYRISTICA.

NUX VOMICA. *Dub.* See STRYCHNOS.

OLEA EUROPÆA. *Lond. Ed. Dub.*

Willd. *g.* 36, *sp.* 1; Spr. *g.* 57, *sp.* 1. *Diandria Monogynia.*—Nat. ord. *Sepiariæ*, Linn., *Jasmineæ*, Juss.

The olive tree *.

Off.—Olive oil. The fixed or expressed oil of the fruit †.

OLEUM FIXUM. Ex fructu. *Ed.* OLEUM OLIVÆ. Druparum oleum expressum. *Lond.* OLEUM. Ex fructu. *Dub.*

THE olive tree is a native of the south of Europe, and north of Africa. It is cultivated in France, Spain, and Italy, for the sake of its fruit, and the oil expressed from it.

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* *Syn.* Ελαια αγρια, Ελαια ἡμερα, (*Diosc.*) Αγρειλια, (*Mod.*) Olivier, (*Fr.*) Europæischer Oelbaum, (*Ger.*) Olivo, (*It.*) Zietron, (*Arab.*) Julpaïy, (*Hindooie.*) Bovaminyak, (*Mal.*)

† *Syn.* Huile fin, Huile vierge, (*Fr.*) Jungfern Olivenöl, (*Ger.*) Oleo vergine, (*It.*)

Olives, when fresh, have a harsh, bitter, and extremely disagreeable taste, and they are eaten only when prepared. They are first steeped for several days in a ley of wood ashes, and then pickled in a strong solution of muriate of soda.

They are principally valued for the oil obtained by expression from their fleshy pericarp.

For this purpose they are gathered when fully ripe, and immediately bruised. The finest, or *virgin oil*, is obtained by simple expression after they have been left in a heap for 10 or 12 days to soften, and begin to ferment. A less pure oil is then got by throwing upon them boiling water to dissolve the mucilage, which retains it. In some countries the olives are allowed to remain in a heap till the mucilage be destroyed. More oil is thus obtained, but of an inferior quality.

Good olive oil should have a pale yellow colour, somewhat inclining to green, a bland taste, without smell, and should congeal at 38° Fahrenheit. We get the best oil from Aix in Provence, and from Lucca and Florence. The Spanish oil is inferior. Olive oil, like all the other unctuous substances, both vegetable and animal, is not an immediate vegetable principle, but an organic product, consisting of various principles, elaine, stearine, or fluid and concrete unctuous matter, and a mucilaginous principle. The last is mechanically mixed. It is always to be considered as an impurity, and is in a great degree deposited by rest. The two former are essential to the constitution of the oil, the stearine being held in solution by the elaine, or crystallizing from it on reduction of temperature. In the frozen state they are easily separated by mere expression, or by means of cold alcohol, which dissolves the elaine, and leaves the stearine.

Olive oil is sometimes mixed with cheaper oil; but the fraud is known by a less tendency to congeal by reduction of temperature. M. Poutet shakes together three ounces of suspected oil with two drachms of solution of protonitrate of mercury for two minutes. If the olive oil be pure it thickens immediately, and next day is a concrete mass; but if it be adulterated with poppy oil, there is only a precipitate, and the quantity of supernatant fluid shews the degree of adulteration. Another method of detecting the adulteration of olive oil, in consequence of its being a much worse conductor of electricity than any other oil, has been proposed by M. Rousseau, who has contrived an apparatus for the purpose, called *Diagometer* or *Elaiometer*. It is the stearine, which, being almost a non-conductor, imparts the property to olive oil, which at a medium conducts electricity 675 times more slowly than other oils.

From the bark of the olive tree there exudes, in the warmer provinces of Europe, a substance improperly called *Gomma di lecce*, or *Gomme d'olivier*. It has been analyzed by Pelletier, who found it to consist of a peculiar principle, which he called *Olivile*, a peculiar resin, and a small quantity of benzoic acid.

Med. use.—Taken internally, olive oil operates as a gentle laxative, and is given in cases of worms. It is also given in large quantities to mitigate the action of acrid substances taken into the stomach. It is used externally in frictions, in gargles, and in clysters; but its principal employment is for the composition of ointments and plasters.

Off. Prep. — Oleum camphoratum, *L. E. D.* Linimentum ammoniæ, *L. E. D.* Lin. ammon. subcarbonatis, *L.* Lin. calcis, *D.* Lin. simplex, *E.* Ceratum simplex, *E. L.* Cerat. cetacei, *L.* Cerat. calaminæ, *L.* Cerat. plumbi subacetatis, *L.* Cerat. plumbi comp. *L.* Cerat. resinæ, *L.* Cerat. saponis, *L.* Unguentum simplex, *E.* Ung. cetacei, *L.* Ung. elemi comp. *L.* Ung. picis nigri, *L.* Ung. acidi nitrici, *D.* Ung. cupri subacetatis, *D.* Ung. hydrargyri nitratis, *L. E. D.* Emplastrum lithargyri, *D. E.* Empl. hydrargyri, *E.* Enema catharticum, *D.*

OLEUM CAJEPUT. *Dub.* See MELALEUCA.

OLIBANUM. *Dub.* See BOSWELLIA.

OPIUM. *Dub.* See PAPAVER.

OPOPONAX. *Lond. Dub.* See PASTINACA.

ORIGANUM.

Willd. *g.* 1116; Spr. *g.* 2082; Smith, *g.* 273. *Didynamia Gymnospermia.*—Nat. ord. *Verticillatæ*, Linn., *Labiatæ*, Juss.

Sp. 10. Willd.; Spr. *sp.* 1. Smith. ORIGANUM VULGARE. *Lond. Dub.*

Common marjoram *.

Off.—The herb and oil.

a) ORIGANUM. *Lond.*

b) OLEUM EX HERBA. *Dub.*

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* *Syn.* Ρίγανον, (*Gr. Hod.*) Origan, (*Fr.*) Gemeiner Dosten, Wilder Majoran, (*Ger.*) Origano, Bergamo, (*It.*)

This is a perennial herb, which grows wild upon chalky hills and gravelly soils. It flowers in July and August, when it is to be collected. It has an aromatic smell, and a corresponding heating and weak bitterish taste. The infusion gives a dirty violet colour to chalybeates, and it yields a straw-yellow volatile oil.

Med. use.—The infusion is used rarely internally as a tea; more frequently externally as a fomentation. It is also put into beer to render it stronger tasted, and prevent its becoming acid.

Off. Prep.—Oleum origani, *D. L. E.*

Sp. 15. Willd.; Spr. *sp.* 12. ORIGANUM MAJORANA. *Ed. Dub.*

Sweet marjoram *.

Off.—The plant.

HERBA. *Ed. Dub.*

Sweet marjoram is an annual herb, indigenous in Portugal, and cultivated in our gardens, principally for culinary purposes. It is a moderately warm aromatic, yielding its virtues both to aqueous and spiritous liquors by infusion, and to water in distillation. It has an agreeable strong smell, and corresponding balsamic, somewhat bitter, acrid and camphoraceous taste. Its virtues depend chiefly on a volatile oil.

Med. use.—An infusion is used externally as an embrocation. It also furnishes an active distilled oil and water, and may be used to flavour an ointment or fixed oil by infusion.

Off. Prep.—Pulv. asari comp., *E.*

OSSA. *Ed. Dub.*

Bones †.

Recent bones consist of about half their weight of phosphate of lime, a third of their weight of cartilage or gelatine, and one-tenth of carbonate of lime. They also contain a little fluate of lime, phosphate of magnesia, soda, and muriate of soda. M. Darcet has shewn how a great deal of nourishment can be extracted from them, by removing the earthy salts by means of muriatic acid.

Off. Prep.—Calcis phosphas præcipitatum, *D.* Sodæ phosphas, *D. E.*

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* *Syn.* Marjolaine, (*Fr.*) Majoran, (*Ger.*) Maggiorana, (*It.*)

† *Syn.* Os, (*Fr.*) Knochen, (*Ger.*) Osse, (*It.*)

Ovum. Phasianus Gallus. *Lond.*

Egg of the dunghill fowl *.

This useful bird is probably a native of India, where it is found wild in the jungles. It is now domesticated almost every where, and furnishes one of the most wholesome and delicate articles of food.

The egg only is officinal. The shell consists principally of carbonate of lime, with a small quantity of phosphate of lime and animal matter. When burnt the animal matter and carbonic acid are destroyed, and we obtain lime, mixed with a little phosphate of lime.

The contents of the egg consist of two substances, the white and the yolk. The white is albumen, combined with a little soda and sulphur. The yolk is also albuminous, but contains moreover a bland oil, and some colouring matter. The white is used for clarification. The yolk is sometimes used in pharmacy for suspending oily and resinous substances in water.

In the French codex there is a formula for obtaining the oil by expression from the yolk hard boiled. It may also be extracted by sulphuric ether, in which it is soluble in all proportions. In pharmacy, it is sometimes used for facilitating the extinction of mercury; and it is used in the arts, under the title of Egg-oil. It soon becomes rancid, and must therefore be prepared when wanted.

Off. Prep. of the white.—Cataplasma aluminis, *D.*

——— *of the yolk.*—Enema terebinthinæ, *D.*

Oxalis acetosella. *Lond.*

Willd. *g.* 918, *sp.* 25; Spr. *g.* 1724, *sp.* 19; Smith, *g.* 217, *sp.* 1. *Decandria Pentagynia.*—Nat. ord. *Gruinales*, Linn., *Oxalideæ*, Juss.

Common wood-sorrel †.

Off.—The leaves.

Acetosella. *Lond.*

This is a small perennial plant, which grows wild in woods, and under hedges, and flowers in April and May. The leaves contain a considerable quantity of superoxalate of potass, and have an extremely pleasant acid taste.

The super-oxalate of potass is extracted in large quantities from them, and sold under the name of *Essential Salt*

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* *Syn.* Œuf, (*Fr.*) Ey, (*Ger.*) Ovo, (*It.*)

† *Syn.* Lujula, (*Off.*) Petite oseille, Surelle, Trefle aigre, (*Fr.*) Sauerklee, (*Ger.*) Luggiola, (*It.*)

of Lemons[*]. Twenty pounds of the fresh leaves yielded to Neumann six pounds of juice, from which he got two ounces two drachms and a scruple of salt, besides two ounces and six drachms of an impure saline mass. They possess the same powers with the vegetable acids in general, and may be given in infusion, or beaten with sugar into a conserve, or boiled with milk, to form an acid whey.

PAPAVER.

Willd. *g.* 1015, *sp.* 4; Spr. *g.* 1885; Smith, *g.* 243. *Polyandria Monogynia.*—Nat. ord. *Rhœades*, Linn., *Papaveraceæ*, Juss.

Sp. 5. Willd.; Spr. *sp.* 6; *sp.* 4. Smith. PAPAVER RHŒAS. *Lond. Dub.*

Corn-rose, or red poppy[†].

Off.—The flower.

PETALA. *Lond. Dub.*

THIS species of poppy is annual, and very common in our corn fields. It flowers in June and July. The petals have a fine crimson colour, which is named from them *Coquelicot.* They have a narcotic smell, and a weak bitter taste. By drying they assume a wine red colour. They are dried with difficulty, and must be kept in a very dry place. They give out their colour readily to water.

The whole plant abounds with a milky juice; but on analysis it furnished only a yellow fat substance, 12; red colouring matter, 40; gum, 20; fibre, 28=100.

Med. use.—The petals are supposed to be calmant, and enter into the pectoral species of foreign pharmacopœias. An extract has been prepared from the heads, which Fouquet tried in epilepsy, and as an anodyne in scirrhous womb.

Off. Prep.—Syrupus papaveris rhœadis, *D.* Syrupus rhœados, *L.*

Sp. 7. Willd.; *sp.* 21. Spr.; *sp.* 8. Smith. PAPAVER SOMNIFERUM. *Ed. Lond. Dub.*

White Poppy[‡].

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[*] *Syn.* Sal acetosellæ, (*Off.*) Binoxalas potassæ, (*Chem.*) Sal d'oseille, (*Fr.*) Kleesalz, (*Ger.*) Ossiosalate di potassa, (*It.*)

[†] *Syn.* Papaper erraticum, (*Off.*) Μηκων ʼροιας, (*Dios.*) Παπαρῦνα, (*Hod.*) Pavot sauvage, Coquelicot, (*Fr.*) Ackermohn, Klappenrose, (*Ger.*) Rosolaccio, (*It.*)

[‡] *Syn.* Μηκων ἡμερος και αγρια, (*Dios.*) Pavot de jardin, (*Fr.*) Gemeiner Mohn, Gartenmohn, (*Ger.*) Papavero domestico, (*It.*) Casa casa, (*Tam. Tel.*) Post, (*Sans. Hindooie.*) Khashkhash, (*Arab. Duk.*) Kooknan, (*Pers.*) Abin attá, (*Cyng.*) Gay sagussa, (*Can.*) Ying-suh, (*Chin.*) Kes, Reisjun, (*Japan.*)

Off.—Poppy heads [*].

a) CAPSULÆ. *Ed.* Capsulæ maturæ. *Lond. Dub.*

THE white poppy is also an annual, and is sometimes found wild in this country, but it is originally a native of the warmer parts of Asia. It flowers in July, and is frequently cultivated for the beauty and variety of its flowers, and for its seeds. The stem is erect, from two to four feet high, more or less branchy, with amplexicaule leaves. The whole plant is glaucous, and yields a milky juice on being wounded. The capsules are ovoid, sometimes depressed in the summit, and surmounted by the stigma, which is persistent. The size varies from that of a small peach to that of a very large orange. They are monolocular, and contain an immense number of small kidney-shaped seeds, attached to *placentæ,* which form imperfect *septa.* The seeds occur of two colours, black, often called Maw seed, and white, or poppy seeds. The former variety has smaller capsules, and is commonly cultivated for the extraction of oil from the seeds. The latter variety furnishes the officinal poppy heads.

The expressed juice of the whole plant, evaporated to the consistence of an extract, was the *Meconium* of the ancients. An extract is also prepared by decoction from the capsules; but these are chiefly used for fomentations, and the preparation of a syrup.

The seeds of the poppy are simply emulsive, and contain none of the narcotic principle. They yield a considerable quantity of fixed oil by expression.

Off. Prep.—Syrupus papaveris, *L. E. D.* Dococtum papaveris, *D.*

Off.—Turkey opium [†]; the concrete juice of the capsules before they are ripe.

b) OPIUM, Succus concretus papaveris somniferi. *Ed.* Capsularum immaturarum succus concretus (Turcicus.) *Lond.* Capsularum succus proprius concretus. *Dub.*

Opium is the inspissated juice of the poppy. In the evening several superficial longitudinal incisions are made in the capsules, when they are almost ripe, with a knife having from three to five blades. The juice which exudes during the night, next day after it has been thickened by the heat of the sun, is collected by means of iron scrapers, and put into an earthen pot. The operation is repeated as long as the heads furnish juice in sufficient quantity, and the opium is worked into masses with a wooden spatula, in the heat of the sun, until it acquires the due degree of thickness, when the masses are covered with poppy or tobacco leaves.

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[*] *Syn.* Capsules de Pavot, (*Fr.*) Mohnköpfe, (*Ger.*) Cassule dei papaveri, (*It.*)

[†] *Syn.* Opium, (*Fr.*) Mohnsaft, (*Ger.*) Opio, (*It.*) Apini, (*Tam. Tel.*) Afiem, (*Duk.*) Ufy oon, (*Arab. Mal.*) Apaynum, (*Sans.*) Sheerikhaskash, (*Pers.*) Abim, (*Cyng.*) Ufeem, (*Hindooie.*) Apium, (*Jav.*) Hapium, (*Bali.*) Caruppa, (*Mal.*) Madjoon, (*Turk.*)

Two kinds of opium are found in commerce, distinguished by the names of Turkey and East-India opium.

Turkey opium is a solid, compact, perfectly opaque substance, of moderate specific gravity, possessing a considerable degree of tenacity, yet somewhat brittle if half cut through; the section dense and a little shining; the fracture earthy, and both nearly uniform in appearance; compact; of a dark-brown colour; becoming softer by the heat of the fingers, difficultly reduced to a light brown powder, unless in the cold, after having been long dried in small pieces; when moistened, marking on paper a light brown interrupted streak, scarcely colouring the saliva when chewed, at least only tinging it of a greenish colour, and rendering it frothy, exciting at first a nauseous bitter taste, which soon becomes acrid, with some degree of warmth, and having a peculiar heavy disagreeable smell. The best kind is in flat pieces; and besides the large leaves in which they are enveloped, they are covered with the reddish capsules of a species of rumex used in packing it. The round masses, which have none of the capsules adhering to them, are evidently inferior in quality. Opium is bad if it be soft or friable, mixed with any impurities, have an intensely dark or blackish colour, a weak or empyreumatic smell, a sweetish taste, or draw upon paper a brown continuous streak.

Notwithstanding its name, which is derived solely from the place from which it is imported into Europe, *Turkey* opium is all produced in *Persia*, and is the concrete juice, which exudes from wounds made in the capsules without any admixture of extract obtained by decoction. Garcias ab Horto, Kaempfer, Chardin, Olivier, and Freygan, are the best authorities on the subject. For a long time the preference was given to the opium of Thebes in Egypt, and by usage the name of *Opium Thebaicum* is still given to select opium.

East-Indian opium has much less consistence, being sometimes not much thicker than tar, and always ductile. Its colour is much darker; its taste more nauseous, and less bitter; and its smell rather empyreumatic. It is supposed to be of only half the strength. One-eighth of the weight of the cakes is allowed for the enormous quantity of leaves with which they are enveloped. In the East Indies, when opium is not good enough to bring a certain price, it is destroyed under the inspection of public officers. No East India opium is now brought for sale to Europe.

In 1797 the cultivation of opium was restricted to Bahar and Benares, and discontinued in Bengal. In 1793 the sales produced £. 250,000, and in 1808–9, £. 594,978. For further authentic information concerning the commerce of opium in the East, the works of Mr Crawford and of Mr Phipps may be consulted.

The best accounts of the production of the East India opium are by Mr Kerr and Mr Howison. The very great inferiority of the Indian to the Persian opium is gradually diminishing. By some European gentlemen in Bengal, opium is now prepared in every respect equal to the best of Persia. On this point I can speak with certainty, having received two considerable samples from Dr Adam of Calcutta, and made frequent comparative trials of its power in hospital practice. Its tincture is darker coloured than that of Turkey opium.

Notwithstanding the successful trials of procuring British opium, especially by Mr Young, I am perfectly satisfied that any attempt to obtain opium in quantity will end in disappointment. The want of heat and the high price of labour on the one hand, and stormy winds and violent rains on the other, are insuperable objections to the culture of the poppy in Britain as a branch of agriculture.

The same objections, however, do not apply to the improvement of the production of opium in our East India possessions, so as at last to supersede the Persian opium in the European market.

Opium is not fusible, but is softened even by the heat of the fingers. It is highly inflammable. It is partially soluble, both in alcohol and in water. Neumann got from 1920 parts of opium, 1520 alcoholic, and afterwards 80 watery extract, 320 remaining undissolved; and inversely 1280 watery, and 200 alcoholic extract, the residuum being 440.

Buchholz got from opium, extractive, soluble both in water and in alcohol, 35.6; gum, 30.4; resin, 9; caoutchouc, 4.8; gluten, 11.4; impurities, 2; loss, probably partly a volatile principle, partly water, 6.8 = 100.

The solutions of opium are transparent and have a brown or vinous colour. The watery solution is not decomposed by alcohol. A small quantity of matter, which, as far as my experiments go, is neither fusible nor remarkably inflammable, is separated from the alcoholic solution by water. I have also observed that neither the watery solution of opium, nor the alcoholic, after it has been precipitated by water, redden vegetable blues. It is not precipitated by acids, but is precipitated copiously by the alkalies and their carbonates, by lime and magnesia, muriate and super-nitrate of mercury, oxymuriate of tin, sulphate of copper, sulphate of zinc, acetate of lead, nitrate of silver, and persulphate of iron. The precipitate in the last case was of a dirty brown colour, not resembling those by alkaline or astringent substances. The solutions of opium, especially the watery, are also copiously precipitated by infusion of galls.

No volatile oil or other volatile principle can be obtained in a separate state from opium.

We are indebted chiefly to Derosnes, Sertuerner, Seguin, and Robiquet, for extending our knowledge of the chemical constitution of opium.

Neumann, Haller, and Tralles had all obtained crystals from opium, and Derosnes and Pagenstecher pointed out the method of procuring them in greater quantity.

By evaporating a watery solution of opium, to the consistence of a syrup, Derosnes obtained a precipitate, which was increased by diluting the extract with a little cold water. He dissolved this in hot alcohol, from which it again separated on cooling. When purified by repeated solutions, it crystallized in rectangular prisms, with rhomboidal bases. It was solid, white, had no taste or smell, was insoluble in cold water, and soluble in 400 parts of boiling water, did not affect vegetable blues, was soluble in 24 parts of boiling alcohol, and 110 cold; soluble in hot ether and volatile oils, and separated from them as they cooled; soluble slowly in oil of olives and oil of almonds below the boiling temperature; soluble in boiling, but not in cold acetic acid, and with nitric acid forming a yellow solution without heat. Exposed to heat it melts, becomes transparent, and remains so after cooling. When burnt it gives out a thick smoke and ammoniacal odour. Robiquet considers this to be a peculiar principle, which he has called *Narcotine*, and has shewn that it may be obtained almost pure, by acting upon the soft watery extract of opium, by ether, which dissolves scarcely any thing but the narcotine.

M. Sertuerner, apothecary in Eimbeck in Hanover, published his first observations and discoveries regarding the nature of the narcotic principle of opium in 1803, but they attracted little notice. He again published a fuller memoir in Gilbert's Annals, in January 1817, which was immediately translated into the French Annals, and his observations were generally confirmed by Gay-Lussac and Robiquet. Sertuerner infused four ounces of powder of opium in repeated portions of cold distilled water, and filtered the solution through cloth. It was evaporated in a glass vessel, with a gentle heat, to eight ounces; which, after standing eight days, deposited six grains of sulphate of potass. The remaining fluid was diluted with distilled water, and yielded a flocculent precipitate on the addition of caustic ammonia, which, after being washed successively with sulphuric ether, caustic ammonia, and alcohol, yielded three drachms of a fine brownish-white powder, to which M. Sertuerner gave the name of *Morphium*, now *Morphia*, and which may be farther purified by solution in boiling alcohol and crystallization. It seemed to be perfectly free from ammonia, yet it possessed all the characteristic properties of an alkali, colouring rhubarb brown, and fernambuc violet, and forming neutral salts with acids. It has a peculiar bitter astringent taste, and its solutions leave a red stain on the skin. Its crystals are very obtuse, single or double pyramids, with a square or long rectangular base, or prisms with a trapezoid base. It dissolves in 82 parts of boiling water, from which it crystallizes on cooling; in 36 of boiling and 42 of cold alcohol, and in 8 of sulphuric ether.

The fluid from which the morphia was precipitated, after being heated to 120 F. to expel the ammonia, was filtered, and a solution of muriate of barytes (or of acetate of lead) added as long as there was any precipitate. The white precipitate, when washed and dried, weighed 7 drachms, and consisted of the barytes mixed with a new acid, to which M. Sertuerner has given the name of *meconic*, and which he separated by sulphuric acid. This mode of obtaining it has not succeeded with others, and its existence was doubted; but M. Choulant, by mixing the meconate of barytes with an equal weight of vitreous boracic acid, and subliming, obtained the meconic acid, in the form of fine white shining scales. Its taste is at first sour and cooling, but afterwards unpleasantly bitter. It reddens vegetable blues, and combines with alkalies and earths, and gives a cherry-red colour to solutions of iron: its crystals are quadrangular tables, and it is soluble in twice its weight of water, and also in alcohol and ether.

Robiquet has altered and improved Sertuerner's process for obtaining morphia, by boiling the watery solution of opium with pure magnesia, and then extracting the morphia from the precipitate by alcohol. This is the method inserted in the French Pharmacopœia.

M. Hottot, apothecary of Paris, in some observations on the extraction of morphia, has said, that the procedure by ammonia is preferable to that by magnesia, and he supports this opinion by positive and comparative experiments. The following is his method :—

Take of opium of commerce one kilogramme; macerate it in a sufficient quantity of cold water to exhaust the opium; unite the liquors. Into the liquor half cold pour a sufficient quantity of ammonia to render it neutral or very slightly alkaline, for which purpose about eight grammes will be required. Let some greasy matter deposit; decant the liquor, and add other sixty-four grammes of ammonia. Leave it to deposit for twelve hours; throw the deposit on a filter; wash it with cold water; then treat it with three kilogrammes of alcohol at 34°; add sixty-four grammes of animal charcoal; heat it in a water-bath, and when the alcohol boils, filter; the morphia by cooling crystallizes, and amounts to six or eight grammes.

Med. use.—The action of opium on the living system has been the subject of the keenest controversy. Some contend that it is a direct sedative, and that it produces no stimulant effects whatever; while others are equally positive that it is a powerful and highly diffusible stimulus, and that the sedative effects, which it undeniably produces, are merely the consequence of the previous excitement. The truth appears to be, that opium is capable of producing a certain degree of excitement, while the sedative effects which always succeed are incomparably greater than could be produced by the preceding excitement. The stimulant effects are most apparent from small doses. These increase the energy of the mind, the frequency of the pulse, and the heat of the body, excite thirst, render the mouth dry and parched, and diminish all the secretions and excretions, except the cuticular discharge, which they increase. These effects are succeeded by languor and lassitude. In larger doses, the stimulant effects are not so apparent; but the excitability is remarkably diminished, and confusion of head, vertigo, and sleep are produced. In excessive doses it proves a violent narcotic poison, exciting headach, vertigo, sopor, lethargy, rarely delirium, muscular relaxation or spasm, or an alternation of these states, pulse various, often frequent, feeble and irregular, often full and slow, breathing slow and stertorous, pupils always sluggish, often insensible, sometimes dilated, oftener contracted; very rarely vomiting; terminated by apoplectic death.

The bad effects of an over-dose of opium are often prevented by the occurrence of vomiting, or by pumping or sucking it out of the stomach by the stomach pump, or by Mr Bryce's syphon. A solution of an alkaline carbonate should also be injected to decompose the opium and render the morphia insoluble. Its effects are best counteracted by the exhibition of repeated doses of diffusible stimuli, and chiefly by not permitting the sufferer to yield to the desire of sleeping. By habit, the effects of opium on the body are remarkably diminished. There have been instances of four grains proving fatal to adults, while others have been known to consume as many drachms daily. The habitual use of opium produces the same effects with habitual dram-drinking; tremors, paralysis, stupidity, and general emaciation; and like it can scarcely ever be relinquished.

MM. Orfila and Magendie have each made experiments to ascertain the effects of the various principles contained in the opium, but these physiologists do not agree in their results. Pure crystallized morphia has little or no effect, on account of its little solubility in the juices of the stomach; but all its solutions in acids, oil, and alcohol, excite the same narcotic effects as the opium itself, and in a smaller dose. Magendie considers the narcotine as the exciting principle of opium; but this is denied by Orfila, who asserts that it produces nausea, vomiting, debility, accelerated circulation and death without the vertigo or affection of the senses, palsy of the extremities, plaintive cries, or convulsions, which arise from morphia.

In disease, opium is chiefly employed to mitigate pain, diminish morbid sensibility, procure sleep, allay inordinate actions, and to check diarrhœa, and other excessive discharges. It is contraindicated in gastric affections, plethora, a highly inflammatory state of the body, and determination of the blood to particular viscera.

In intermittents, it is said to have been used with good effect in every stage.

In fevers of the typhoid type, accompanied with watchfulness or diarrhœa, it is extremely useful; but when not indicated by particular symptoms, it does harm, by augmenting thirst, and producing constipation.

Especially when combined with calomel, it has lately been much employed in inflammations from local causes, such as wounds, fractures, burns, from absorption of morbid poisons, as in swelled testicle, &c. and even in active inflammations, accompanied with watchfulness, pain, and spasm, after blood-letting.

In small pox, when the convulsions before eruption are frequent and considerable, or when the accompanying fever is of the typhoid type, opium is liberally used. It is likewise given from the fifth day onwards; and is found to allay the pain of suppuration, to promote the ptyalism, and to be otherwise useful.

In dysentery, after the use of gentle laxatives, or along with them, opium, independently of any effect it may have on the fever, is of consequence in allaying the tormina and tenesmus, and in obviating that laxity of bowels which so frequently remains after that disease.

In diarrhœa, the disease itself generally carries off any offending acrimony, and then, or after purgatives, opium is used with great effect. Even in the worst symptomatic cases, it seldom fails to alleviate.

In cholera and pyrosis, it is the best remedy.

In colic, it is employed with laxatives; and often prevents ileus and inflammation, by relieving the spasm. Even in ileus it is sometimes used to allay the vomiting, the spasm, and the pain.

It is given to allay the pain, and favour the descent of calculi, and to give relief in jaundice and dysuria proceeding from spasm.

It is of acknowledged use in the different species of tetanus; affords relief to the various spasmodic symptoms of dyspepsia, hysteria, hypochondriasis, asthma, rabies canina, &c. and has been found useful in some kinds of epilepsy.

In syphilis it is useful in combating symptoms, and in counteracting the effects resulting from the improper use of mercury.

It is found useful in certain cases of threatened abortion and lingering delivery, in convulsions during parturition, and in the after-pains and excessive flooding.

The administration of opium to those unaccustomed to it is sometimes difficult. The requisite quantity is very different in different persons, and in different states of the same person. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another; and a dose that might prove fatal in cholera or colic would not be perceptible in many cases of tetanus or mania. When given in too small a dose, it is apt to produce disturbed sleep, and other disagreeable consequences; but sometimes a small dose has the desired effect, while a larger one gives rise to vertigo and delirium, and with some constitutions it does not agree in any dose or form. Its stimulant effects are most certainly produced by the repetition of small doses, its anodyne by the giving of a full dose at once. In some it seems not to have its proper effect till after a considerable time. The operation of a moderate dose is supposed to last in general about eight hours from the time of taking it.

Externally, opium is used to diminish pain and to remove spasmodic affections. It is found particularly serviceable in chronic ophthalmia, when accompanied with morbidly increased sensibility.

Opium may be exhibited, 1. In substance, made up in the form of a pill, lozenge, or electuary. Its most efficient form. 2. Dissolved in diluted alcohol, or white wine. 3. Dissolved in water, or watery fluids. Very perishable. 4. Dried and reduced to powder. 5. In various chemical preparations.

It is often given in combination with aromatics, astringents, emetics, bitters, camphor, soap, distilled waters, mucilage, syrups, acids, carbonate of ammonia, ether, acetate of lead, tartrate of antimony and potass, and unctuous substances. Some of these are certainly unchemical mixtures; for I find by experiment that the solutions of opium are copiously precipitated by astringents, the alkaline carbonates, and all the metallic salts.

Off. Prep. — Extractum opii aquosum, *D. L.* Tinctura opii, *D. E. L.* Tinct. opii camph. *D. L.* Tinct. opii ammoniat. *E.* Tinctura saponis et opii, *E.* Acetum opii, *D.* Vinum opii, *D.* Pulvis ipecacuanhæ comp. *D. E. L.* Pulvis opiatus, *E.* Pulvis cornu usti cum opio, *L.* Pulv. cretæ comp. cum opio, *L.* Pilulæ saponis cum opio, *D. L.* Pilulæ e styrace, *D.* Pilulæ opiatæ, *E.* Electuar. catechu comp. *D. E.* Elect. opiat. *E.* Confectio opii, *L.* Trochisci glycyr. cum opio, *E.* Emplastrum opii, *D.*

PASTINACA OPOPONAX. *Lond. Dub.*

Willd. *g.* 558, *sp.* 3. *Pentandria Digynia.*—Nat. ord. *Umbellatæ,* Linn. Juss.

Opoponax [*].

Off.—A gum-resin.

GUMMI RESINA. *Lond. Dub.*

THIS plant is perennial, and indigenous in the south of Europe. It is now the *Ferula opoponax* of Sprengel, in which he includes also the *Laserpitium Chironium* Lin. The gum-resin, which is said to be obtained by wounding the stalk or root, is brought from the Levant, sometimes in round drops or tears, but more commonly in irregular lumps, of a reddish-yellow colour on the outside, with specks of white, inwardly of a paler colour, and frequently variegated with large white pieces. It has a peculiar strong smell, and a bitter, acrid, somewhat nauseous taste.

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[*] *Syn.* Οποπoναξ, (*Dios.*) Opoponax, (*Fr.*) Panaxgummi, (*Ger.*) Oponaco, (*It.*) Jawesheen, (*Arab.*) Gawsheen, (*Pers.*)

Neumann got from 480 parts, 166 alcoholic, and afterwards 180 watery extract; and inversely, 226 watery, and 60 alcoholic. Both the water and alcohol distilled from it were impregnated with its flavour. It forms a milky solution with water, and yields a little essential oil on distillation. It has been analyzed by Pelletier: Resin, 42; gum, 33.4; starch, 4.2; extractive and malic acid, 4.4; lignine, 9.8; wax, 0.3; volatile oil and loss, 5.9; caoutchouc traces =100.

Med. use.—It was formerly considered as an emmenagogue, but is now scarcely used.

PETROLEUM. *Lond. Dub.* See BITUMEN.

PIMENTA. *Lond. Dub.* See MYRTUS.

PIMPINELLA ANISUM. *Ed. Lond. Dub.*

Willd. *g.* 562, *sp.* 8. *Sison Anisum*; Spr. *g.* 1045, *sp.* 2. *Pentandria Digynia.*—Nat. ord. *Umbellatæ*, Linn. Juss.

Anise *.

Off.—The seeds.

SEMINA. *Ed. Dub. Lond.*

ANISE is an annual umbelliferous plant, growing wild in Crete, Syria, and other places of the East. It is cultivated in some parts of France, Germany, and Spain, and may be raised also in England. The seeds brought from Spain, which are smaller than the others, are preferred.

The seeds are pedunculated, perfectly oval, striated, slightly villous, scarcely a line long, and of a brownish or greenish-yellow colour.

Aniseeds have an aromatic smell, and a pleasant warm taste, accompanied with a degree of sweetness. Water extracts very little of their flavour; rectified spirit the whole, which depends upon the volatile oil.

Med. use.—They are carminative.

Off. Prep.—Oleum anisi, *D. L. E.* Spiritus anisi, *D. L.*

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* *Syn.* Ανισον, (*Dios.*) Grains d'anis, (*Fr.*) Aniess, (*Ger.*) Aniso, (*It.*) Somboo, (*Tam.*) Sompoo, (*Tel.*) Jera manis, (*Malay,*) Anisu, (*Guz.*) Sataphuspha, (*Sans.*) Sonf, (*Duk.*) Anison, (*Arab.*) Razyaneh roomie, (*Pers.*) Mungfi, Adis manis, (*Jav.*) Kadis manis, (*Bali.*)

Pinus.

Willd. *g.* 1711; Spr. *g.* 3143; Smith, *g.* 408. *Monœcia Monadelphia.*—Nat. ord. *Coniferæ*, Linn. Juss.

Resina pini. Ex variis pinis.
1. Liquida, vulgo
    a) Terebinthina veneta.
    b) Terebinthina vulgaris.
2. Solida.
    a) Sponte concreta, vulgo Pix burgundica.
    b) Oleo volatile privata, vulgo Resina alba.
3. Empyreumatica, vulgo Pix liquida.
Pini oleum volatile.
Ed.

Pix liquida, e speciebus pini diversis. *Dub.*

Sp. 1. Smith; Willd.; *sp.* 15. Spr. Pinus sylvestris. *Lond. Dub.*

Scotch fir.

Off.—Common Turpentine. Oil of Turpentine. Rosin. Tar. Black pitch.

a) Terebinthina vulgaris, resina liquida. *Lond.* Terebinthina vulgaris. *Dub.*
b) Terebinthinæ oleum; oleum e Terebinthina destillatum. *Lond.* Oleum volatile. *Dub.*
c) Resina flava; residuum postquam Oleum Terebinthinæ destillatum est. *Lond.* Resina. *Dub.*
d) Pix liquida; resina præparata liquida. *Lond.*
e) Pix nigra; resina præparata solida. *Lond.*

Sp. 7. Willd.; *sp.* 41. Spr. Pinus larix. *Dub.*

The larch.

Off.—Venice Turpentine.

Resina liquida. *Dub.*

Sp. 27. Willd.; *sp.* 2. Spr. Pinus balsamea. *L. D. E.*

The Hemlock fir.

Off.—Balsam of Canada; Canadian Turpentine.

Resina; resina liquida. *Ed.* Terebinthina canadensis; resina liquida. *Lond.* Resina liquida. *Dub.*

Sp. 32. Willd.; *sp.* 10. Spr. Pinus abies. *Lond. Dub.*

The Spruce fir.

Off.—Common Frankincense. Burgundy Pitch.

a) Abietis resina; resina concreta. *Lond.* Thus. *Dub.*
b) Pix abietina; resina præparata. *Lond.* Resina. *Dub.*

These different species of fir are all natives of sandy situations. The first alone is a native of this country. The Abies grows in the north of Europe; the Larix in the alpine regions of the south; and the Balsamea in Canada.

The following conspectus of this tribe, altered from MM. Moringlane, Duponchel, and Bonastre, in answer to a prize question by the Pharmaceutic Society of Paris, may be useful.

Section i.—*Pines; leaves in groups of* 2-3-5.

Pinus maritima Lamb; *P. Halepensis* Spr. Aiton.—Sea pine—Pine of Landes—Sea-coasts of the south of Europe. Product: Turpentine of Bourdeaux; contains much volatile oil; employed in the navy and in the arts; little esteemed in pharmacy.

Pinus sylvestris Lin.—Scotch fir—North of Europe. Product: Tenacious thick resin, containing little oil; yields excellent tar, pitch, and *brais gras* for the navy.

Pinus rigida Mill, Spr.—Rigid pine—Coast of Canada, very cold climate. Product: Resinous juice, *cru noir;* resin like the preceding.

Pinus australis Mx.; *P. palustris* Ait.—Missisippi pine—Sea-coast of Carolina and Florida. Product: Boston turpentine; yields one-sixth of good oil; false elemi, resin for making soap, and the best tar for cordage.

Pinus Strobus Lin. — Weymouth pine — Virginia. Product: American turpentine; more fluid than the others, and yields more oil; is mixed with Boston turpentine.

Pinus Cembra Lin. — Siberian stone pine — European Alps. Product: A very fluid turpentine; its branches macerated in water, and distilled, yield the Carpathian balsam.

Section ii.—*Firs; leaves solitary; cones erect.*

Abies taxifolia Desf.; *A. pectinata,* D. C.; *Pinus picea,* L. Spr.—Silver fir—European Alps. Product: Strasburgh turpentine; yields two resins, the one, deposited in blisters, remains clear and fragrant; the other, obtained by incision, gets turbid, and resembles pitch (*poix.*)

Abies balsamifera Mx.; *Pinus balsamea* L. Spr.; *Abies taxifolia* Raj.—Balm of Gilead—North America. Product: Spurious balsam of gilead; deposited in blisters, preserves its limpidity, smell and strength. Balsam of Canada obtained by incision is less fragrant, less clear, and thicker.

False Firs, Spruces; cones pendent.

Abies picea Mill; *P. picea* Du Roi; *P. abies* Lamb. Willd.

—Norway spruce fir.—North of Europe and Asia. Product: White pitch; a thick resin, at first clear, then turbid and soon hardens; very little oil.

Abies Canadensis; P. Canadensis Spr.; *P. Americana* Du Roi—Hemlock spruce—North America. Product: *Cru resineuse,* of which is made the North American pitch. It is tar boiled down to one half.

Abies nigra; P. nigra Ait. Spr.; *P. mariana* Ehr.; *P. denticulata* Mx.—Black spruce—North America. Product: Black essence; constitutes more than two-thirds of the tar of Ohio, Lake Champlain, as far as Newfoundland.

Abies orientalis; P. orientalis Spr. — Levant spruce. Product: Spruce tears; resin exuding naturally from the extremities of the branches, remains clear.

Larches: Leaves deciduous and in bundles.

Larix Europæa D. C.: *Pinus Larix* Spr.; *Abies Larix* Lamb.—Common larch—European Alps. Product: Venice, Briançon or Swiss turpentine; occurs rather towards the centre of the tree, and sometimes in small reservoirs; the turpentine most employed in pharmacy; yields also Briançon manna; and gum Oremburgh, according to Pallas.

Larix Cedrus, Pinus cedrus Spr.—Cedar of Lebanon—Syria, Caucasus. Product: Cedar resin; yields also a saccharine substance, the cedar honey of the ancients, analogous to Briançon manna; young seeds filled with a resinous acrid juice.

Pinus Dammara Lamb. *Agathis loranthifolia* Salisb.—Oval-leaved larch—Mountains of Amboyna. Product: White dammar; its oil evaporates very quickly, and there results a resin as hard as stone.

Dombeya excelsa; D. Chilensis Lamb; *Colymbea quadrifaria* Salisb. Spr.; *Aracauria imbricata* Pavon—Norfolk island pine. Product: Glutinous turpentine, of a milky whiteness; the body of the tree, according to some, contains none.

Thuya articulata.—North of Africa. Product: Sandarac, a dry resin; flows by incision, or, according to Desfontaines, naturally.

All the tribe abound in every part with resinous juice, which possesses the same general properties, but presents some varieties, according to the nature of the species and mode of preparation.

We may arrange the products,

1. Into those which exude spontaneously;
2. Into those procured by wounding the tree;
3. Into those procured by decoction; and,
4. Into those which are procured by the action of fire.

By Exudation.

The *pinus larix* exudes a species of manna, called Briançon manna, which is not used; as, besides the saccharine matter, it evidently contains turpentine.

From the *pinus abies*, and also from the *pinus sylvestris*, in warm seasons and climates, a resinous juice exudes spontaneously, which hardens into tears by exposure to the air. It is the common frankincense, or *Thus* of the former editions of the London Pharmacopœia. It is a solid brittle resin, brought to us in tears, or masses, of a brownish or yellowish colour on the outside; internally whitish, or variegated with whitish specks, of a bitterish, acrid, not agreeable taste, with little smell.

Off. Prep.—Emplastrum aromaticum, *D.* Emplast. thuris, *D.* Empl. galbani comp. *L.* Empl. opii, *L.*

By Incision.

To obtain the products of the second kind, a series of wounds is made through the bark into the wood, beginning at the bottom, and rising gradually upwards, until a stripe of the bark, about nine feet high, be removed, which is commonly effected in about four years. The same operation is repeated on the opposite side. The operation is then recommenced close to the edge of the former wound, which by this time is nearly closed. A tree worked in this manner will survive, and furnish turpentine for near a century. The juice, or turpentine, which flows from these wounds, during summer, is collected in a small cavity formed in the earth, at the bottom of the incisions, from which it is occasionally removed into proper reservoirs previous to its purification.

As the trees exude very little juice during cold weather, no new incisions are made in winter; but the old ones get covered with a soft resinous crust (called *barras*, when it is impure, and mixed with bits of bark, dust, and sand; *gallipot*, when collected with more care; or *white incense*, when it is allowed to remain so long exposed that it becomes resinified,) which is scraped off, and collected for subsequent purification, by liquefaction and filtration. These products consist almost entirely of essential oil and resin, and differ only in the proportions, the turpentine containing the largest proportion of oil, and the gallipot of resin. Although gallipot contains volatile oil, the quantity is so small, that it is never subjected to distillation, but is purified by melting it with a very gentle fire, and straining it. By this process it still contains volatile oil, and is often sold by the name of Burgundy pitch. If boiling water be added to it after it is strained, but while it is still fluid, and they be agitated together till the mass cools, we have a yellow resin, which, from still containing some essential oil, is preferred to that prepared by a similar process from the residuum of the distillation of turpentine. A mere mixture of gallipot and barras, made without heat, is often sold under the name of Burgundy pitch; but the mass resulting from this combination soon becomes friable. It has not the unctuosity, viscidity, tenacity, and smell, which distinguish the real kind.

According to Tingry, real burgundy pitch is obtained from the *Pinus picea*, or spruce fir-tree. The resinous juice which exudes from this species is less fluid and less transparent than the proper turpentines. It is collected by the peasants, strained through cloths, and put into barrels. If its consistence be too thick, it is mixed over the fire with a little turpentine and oil of turpentine.

Off. Prep. — Emplast. opii, *D.* Empl. calefaciens, *D.* Empl. picis comp. *L. E.* Empl. meloes vesicat. comp. *E.* Ungt. resinæ albæ, *D.*

Turpentines, or fluid resinous juices obtained by incision, have different appellations, chiefly according to the country from which they are procured.

Balsam of Canada, from the *Pinus balsamea* and *Pinus Canadensis.*

PINI BALSAMEÆ RESINA. *Ed.* RESINA LIQUIDA. *Dub.*
TEREBINTHINA CANADENSIS. *Lond.*

Cyprian turpentine, from the *Pistacia Terebinthus.*

TEREBINTHINA CHIA. *Lond. Dub.*

Strasburgh turpentine, from the *Pinus picea.*

Venice turpentine, from the *Pinus Larix.*

TEREBINTHINA VENETA. *Ed. Dub.*

Common turpentine, from the *Pinus sylvestris.*

TEREBINTHINA VULGARIS. *Lond. Dub. Ed.*

Hungarian balsam, from the *Pinus sylvestris*, var. *Mughos.*

Carpatian balsam, from the *Pinus Cembra.*

None of these are properly balsams; which term is now confined by chemists to those resinous substances which contain benzoic acid. The London College have done well in retaining Turpentine as a proper generic name for these oleo-resinous juices.

All these species of turpentine possess the same general properties. They are more or less fluid, with different degrees of transparency; of a whitish or yellowish colour; a penetrating smell, and a warm, pungent, bitterish taste. They are entirely soluble in alcohol, combine with fixed oil, and impart their flavour to water, but are not soluble in it. They are decomposed by a moderate heat, being separated into an essential oil and a resin, and are exceedingly inflammable, burning with a large white flame, and much smoke.

Each species has some peculiarities. The Canadian is reckoned the best, and next to it the Chian. They are more transparent, and have a more agreeable flavour than the other kinds. The common turpentine is the most offensive; its principal use is in plasters and ointments, and for the distillation of the essential oil.

Off. Prep.—Oleum terebinthinæ, *D.* Emplast. ammoniaci cum hydrargyro, *D.* Enema terebinthinatum, *D.*

By distillation turpentines are analysed into two products, a volatile oil and a solid resin.

Oil of Turpentine is officinal in the Edinburgh and London Pharmacopœias; by the Dublin College directions are given for its preparation.

Oil of turpentine is lighter than water, transparent, limpid, and volatile. It has a bitter taste, and a penetrating smell; is highly inflammable, and possesses all the other properties of essential oils.

It is sparingly soluble in rectified spirit. Boiling spirit dissolves it more abundantly; but on standing, the greatest part of the oil falls to the bottom. I find that one part of alcohol 0.803 dissolves five of oil of turpentine 0.865.

Off. Prep.—Oleum terebinthinæ rectif. *D. L.* Oleum volatile pini purissimum, *E.* Linimentum terebinthinæ, *L. D.*

Resins.—The residuum of the distillation gets different names, according to some peculiarities in its treatment. When the distillation is performed without addition, and continued until the whole essential oil be driven off, and there appear some traces of empyreuma, the residuum is Fiddlers rosin, or Colophony; but if, while the mass is still fluid, a quantity of water be added, and thoroughly blended with the resin by long and constant agitation, it is then called Yellow rosin, Resina flava, *D.* Resina alba, *E.*

The under part of the cake of the residuum of the distillation resembles fiddlers rosin, the action of the fire having entirely expelled the water and volatile oil, and rendered it slightly empyreumatic and transparent, while the upper part, from retaining some water, is opaque and yellow.

Off. Prep.—Ceratum resinæ, *L.* Ungt. picis nigri, *L.* Ungt. infusi meloes vesicat. *E.* Empl. ceræ, *L.* Emplast. hydrargyri, *E.* Empl. cantharidis, *E. D.* Empl. oxidi ferri rubri, *E.* Emp. picis comp. *L.* Empl. resinæ, *L. E. D.* Emp. simplex, *E.* Emp. hydrargyri cum resina, *E.*

By Decoction.

A fluid extract, prepared by decoction from the twigs of the *pinus sylvestris*, is the well-known Essence of spruce, which, fermented with molasses, or sugar and water, forms the fashionable and wholesome beverage of Spruce beer.

By Fire.

The last kind of products from the different species of fir is obtained by the action of fire. With this view a conical cavity is dug out in the earth, communicating at the bottom with a reservoir. Billets of wood are then placed, so as not only to fill the cavity, but to form a conical pile over it, which is covered with turf, and kindled at the top. The admission of air is so regulated, that it burns from above downwards, with a slow and smothered combustion. The wood itself is reduced to charcoal, and the smoke and vapours formed are obliged to descend into the excavation in the ground, where they are condensed, and pass along with the matters liquefied into the receiver.

Tar, PIX LIQUIDA, *Ed. Lond. Dub.*, is a mixture of resin, empyreumatic oil, charcoal and acetic acid. Its colour is derived from the charcoal; and the other properties in which it differs from a common resin depend on the presence of acetic acid and empyreumatic oil.—The acid itself is not only soluble in water, but also renders the empyreumatic oil more soluble.

Off. Prep.—Ung. picis liquidæ, *D. L. E.* Aqua picis liquidæ, *D.*

By long boiling, tar is deprived of its volatile ingredients, and converted into Pitch, PIX NIGRA. *Lond.*

Med. use.—Taken internally, the *turpentines* are active stimulants, open the bowels, and increase the secretion of urine, to which they give the smell of violets, even though applied only externally. They are rarely given internally except in gleets, leucorrhœa, and other chronic mucous fluxes. Their dose is from a scruple to a drachm and a half. They are most commodiously taken in the form of a bolus, or blended with watery liquors, by the mediation of the yolk of an egg, or mucilage. They also may be given in the form of electuary, mixed with twice their weight of honey, and in the dose of a drachm twice or thrice a-day. They are most frequently administered in the form of clyster, half an ounce being well triturated with the yolk of an egg, and mixed with half a pound of gruel, or decoction of chamomile; in cases of obstinate constipation, depending on atony of the large intestines, in hysteria, and other nervous affections, and in worms.

As a medicine, *Oil of turpentine* is highly stimulating and penetrating. Internally it acts as a diuretic or sudorific in very small doses. It has also been given in large doses, mixed with honey, principally in *sciatica*, *lumbago*, and other forms of neuralgia. But it has not been often successful, and sometimes has had the effect of inducing bloody urine.

Lately, however, its use in very large doses has been renewed, and with almost invariable success, in one of the most obstinate complaints to which the human body is subject, the tape worm. For this valuable discovery we are indebted to Dr Fenwick of Durham; although its use, in worms, and also in epilepsy, seems to have been previously known to Dr Latham. It has been given even to the extent of four ounces in one dose, without any perceptible bad effects, and scarcely more inconvenience than would follow from an equal quantity of gin. In large doses it is not apt to produce strangury, but only an approach to intoxication; and it generally acts as a speedy purgative, and discharges the worm, in all cases, *dead.*

Dr Ed. Perceval also prescribed it in epilepsy, and with some success. ʒ ii. ʒ iv. or ℥ i. were mixed by means of syrup, with ℔ j. of mint water; and of this emulsion, one or two table spoonfuls were given every four hours. In this form, and given to the extent of several drachms in the course of the day, it produced no distressing symptoms of the urinary organs, stomach, or bowels. It generally procured immediate and decided relief, but it was not always lasting. Dr Latham suggests, that a large dose should at first be given, and then small doses, so as to keep up the affection of the head peculiar to its use.

In Dublin oil of turpentine was given internally as a kind of specific in puerperal peritonitis, by Dr Brennan; and although its stimulating nature seemed to contra-indicate its use in an affection of an inflammatory nature, experience has shewn that in some cases it produces excellent effects.

Dr Magee says, that he has always found it a safe and efficacious purgative, and a powerful auxiliary in the cure of some of the most formidable diseases. In obstinate constipation it stands without a rival. I find ʒij. with ʒiv. of castor oil in the form of a draught operate very efficiently. In enteritis, peritonitis, colic, and certain inflammatory and spasmodic affections of the abdominal viscera, it acts almost as a specific. It is also efficacious in checking the hæmorrhage in dysentery; and Dr Magee has used it with success in *hæmorrhœa petechialis.* Half an ounce is given for a dose, with an equal quantity of castor oil, and a little aromatic water; and the power it has of remaining on the stomach, even when nausea is present, is remarkable. In smaller doses it generally produces strangury and other unpleasant effects. Some habits, however, cannot bear oil of turpentine. I have seen large doses produce temporary intoxication, and sometimes a kind of trance lasting twenty-four hours, without however any subsequent bad effect. The largest dose I have known given has been three ounces, and this without injury.

Externally it often produces excellent effects in indolent tumors; in paralysis of the extremities, and in bruises; in nervous pain and in spasms; and as a styptic, when applied on compresses to the bleeding mouths of the vessels, as hot as the patient can bear it; and in the same manner it forms part of Mr Kentish's treatment of burns.

Tar-water is a heating diuretic and sudorific remedy; but by no means so powerful, or so generally admissible, as it was represented by Bishop Berkeley. Fumigations of tar have been recommended in phthisis by Sir A. Crichton. In some cases of catarrhal phthisis and hepatization they give relief, by exciting expectoration, but never effect a cure of tuberculous phthisis. Tar made into an ointment is applied externally in tinea capitis and some other cutaneous diseases.

Dr Bateman has seen good effects in ichthyosis from *pitch* given internally. It occasioned the rough cuticle to crack and fall off, without the aid of external means, and left a sound skin underneath. This medicine, made into pills with flour, or any farinaceous powder, may be taken to a great extent, ʒiij. or ℥ſs daily, not only without injury, but with advantage to the general health. It affords one of the most effectual means of controlling the languid circulation, and the inert and arid condition of the skin.

PIPER.

Willd. *g.* 74; Spr. *g.* 130. *Diandria Trigynia.*—Nat. ord. *Piperitæ*, Linn. Juss.

Sp. 1; Spr. *sp.* 77. PIPER NIGRUM. *Lond. Ed. Dub.*
Black pepper [*].

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[*] *Syn.* Poivre, (*Fr.*) Schwartze Pfeffer, (*Ger.*) Pepe nero, (*It.*) Mellaghoo, (*Tam.*) Gammiris, (*Cyng.*) Mirialoo, (*Tel.*) Meeritch, (*Hindooie*,) Maricha,

Off.—The berry.

Fructus. *Ed.* Semina. *Dub.* Baccæ. *Lond.*

The black pepper is the fruit of a shrubby climbing plant, indigenous in the East Indies, and cultivated, with much advantage to the fruit, in Java and Malabar. The berries are gathered before they are ripe, and are dried in the sun. They become black and corrugated on the surface; their taste is hot and fiery, and their smell slightly aromatic.

Black pepper has been analysed by Pelletier and by Poutet. Its acrimony depends upon a concrete fixed oil, soluble in ether and alcohol, uniting with unctuous substances, and differing only in its acrimony from other fixed oils. But it also contains a peculiar crystalline matter called *Piperine*, not acrid, melting about 212°, totally insoluble in cold water, in small quantities at 212°, separating as it cools; very soluble, especially at an increased temperature, in alcohol, less so in ether; very soluble in acetic acid, and forming plumose crystals; acetic and alcoholic solutions decomposed by water, not affected by dilute sulphuric, nitric or muriatic acids; decomposed by the concentrated acids; seems not to contain nitrogen. Pepper also yields a substance like the extractive found in legumes by Vauquelin, which has the property of being precipitated by infusion of galls. Besides these principles there is a bland balsamic volatile oil, malic and tartaric acids, starch, bassorine and lignine.

White pepper is the fruit of the same plant, gathered after it is fully ripe, and freed of its external coats by maceration in water. It is smooth on the surface, and less pungent than the black pepper.

Dr Paris informs us, that not only is ground pepper adulterated with the powder of the husks of mustard seed, but that there are artificial pepper corns, which may be easily detected by their falling to powder when thrown into water.

It is singular, that the Sumatrans, who eat such vast quantities of Cayenne pepper, never mix black pepper with their food. They esteem the latter heating, and ascribe a contrary effect to the former; and Mr Marsden, from personal experience, agrees with them.

Off. Prep.—Confectio piperis nigri, *D.* Conserva rutæ, *D.* Ungt. piperis nigri, *D.* Emplast. cantharidis vesicat. comp. *E.*

(*Sans.*) Gol-mirch, (*Hind.*) Kali-mirchie, (*Duk.*) Filfil uswad, (*Arab.*) Filfil seeah, (*Pers.*) Lada, (*Mal.*) Maricha, (*Jav.*) Micha, (*Bali,*) Sahan, (*Palembang,*) Kaly-meerchingay, (*Mah.*) Hootseaou, (*Chin.*)

Sp. 12.; Spr. *sp.* 99. PIPER LONGUM. *Lond. Ed. Dub.*

Long pepper [*].

Off.—The fruit.

FRUCTUS. *Ed.* FRUCTUS immaturus et siccatus. *Lond.* SEMINA. *Dub.*

THE plant which bears the long pepper is also a sarmentaceous climber. The berries are small round grains, disposed spirally in a long cylindrical head. They are gathered before they are ripe, and dried. They are the hottest of all the peppers.

Off. Prep.—Confectio opii, *D. L.* Pulvis aromaticus, *D. L.* Pulvis cretæ comp. *D. L.* Tinct. cinnamomi comp. *L. E.*

Spr. *sp.* 58. PIPER CUBEBA. *Dub.*

Cubébs [†].

Off.—The fruit.

FRUCTUS. *Dub.*

THIS is a sarmentaceous climber, found in the woods of Java. The berries are about the size of black pepper corns, and always furnished with a long thin peduncle. They are externally of a grey colour, and wrinkled, and contain a white kernel. Their smell is aromatic, and they have a warm camphoraceous taste. Schönwald, (*Vide* Hagen,) got from 10 ℔. above 11 oz. of a volatile oil, of the thickness of almond oil, a grey colour, and bland to the taste. The watery decoction was tolerably acrid, but the spirituous extract more so.

Cubébs have been analyzed by M. Vauquelin, who has extracted from them a volatile oil almost concrete; a resin analogous to that of copaivi; a small quantity of another coloured resin; a coloured gummy matter; an extractive principle analogous to that which is found in leguminous plants; and some saline substances.

Med. use.—The Cubeb has a very striking power of checking and curing gonorrhœa, taken in powder to the extent of ʒ iij. five or six times a-day, and continued for a day or two after the discharge stops. In a few cases it produces swelled testicle, and in one it produced urticaria. Its only sensible effects are purging, discharge of flatus, sometimes increase of urine, and imparting to it its peculiar smell. It is also of use in leucorrhœa. These effects have been verified by myself, and many others, by repeated experience.

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[*] *Syn.* Poivre long, (*Fr.*) Lange Pfeffer, (*Ger.*) Pepe lungo, (*It.*) Tipilie, (*Tam. Cyng.*) Pipuloo, (*Tel.*) Pipilie, (*Duk.*) Pipel, (*Hind.*) Pippali, Krishna, (*Sans.*) Dar filfil, (*Arab.*) Filfili daraz, (*Pers.*) Tabee, (*Mal.*) Chabi-jawa, (*Jav.*)

[†] *Syn.* Poivre à queue, (*Fr.*) Cubebe, Schwindelkörner, (*Ger.*) Pepe caudato, (*It.*) Val mellaghoo, (*Tam.*) Cubab chinie, (*Hind.*) Duncke mirchie, (*Duk.*) Komoonkoos, (*Malay.*) Salavamirrialoo, (*Tel.*) Kebabeh, (*Arab.*) Walgummeris, (*Cyng.*) Sughanda marichu, (*Sans.*) Kumukus, (*Jav.*) Lada barekion, (*Malay.*)

Off. Prep.—Tinctura piperis cubebæ, *D.*

PISTACIA.

Willd. *g.* 1782; Spr. *g.* 3184. *Diœcia Pentandria.*—Nat. ord. *Amentaceæ*, Linn., *Terebinthaceæ*, Juss.

Sp. 4; Spr. *sp.* 4. PISTACIA TEREBINTHUS. *Lond. Dub.*

Off.—The liquid resin called Chian turpentine[*].

TEREBINTHINA CHIA. *Dub.* Resina liquida. *Lond.*

THE shrub which yields this turpentine grows in the north of Africa, and south of Europe; but the turpentine is principally collected in the islands of Chios and Cyprus. The finest exudes spontaneously, but only when the weather is very warm. It is at first very fluid, but soon thickens by the contact of the air. It is also got by incisions, and is purified by filtration.

Its consistence is thick, tenacious; colour white, with a slight tint of yellow; transparent; smell penetrating, peculiar, sweeter than that of the pine turpentines; taste slightly bitter. By long keeping it gets thicker, but does not become dry, unless after a very long time.

Med. use.—It was employed by Hippocrates, but is now little used, probably on account of its high price. It is habitually chewed by the Turks and Persians, to render the breath fragrant, and preserve the teeth.

Sp. 6; Spr. *sp.* 1. PISTACIA LENTISCUS. *Ed. Lond. Dub.*

Off.—The resin[†].

RESINA. *Ed. Dub.* MASTICHE. Resina. *Lond.*

THIS species is a native of the same countries with the former. The resin is obtained principally in the island of Chios, by making transverse incisions into the tree, and allowing the juice to harden. Mastiche occurs in tears of various sizes, the larger compressed, the smaller round or irregular, smooth, covered with grey powder, diaphanous, fragile, fracture flat, brilliant; colour pale yellow; smell very agreeable; taste weak, agreeable, balsamic, softening and becoming ductile in the mouth, and getting the appearance of white wax; fusible, inflammable, and exhaling a pleasant flavour. It is soluble in oil of turpentine, scarcely soluble in fixed oil, insoluble in water. Alcohol dissolves about nine-tenth parts, leaving a substance called *Masticine*, having much analogy with caoutchouc. By distillation mastiche imparts its flavour to water, but yields no oil.

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[*] *Syn.* Θερμινθη, (*Hipp.*) Τετραμιθος, (*Gr. Hod.*) La terebinthine de Chio, (*Fr.*) Zyprische Terpentin, (*Ger.*) Trementina di Cipro, (*It.*)

[†] *Syn.* Σχινος, (*Dios.*) Mastic, (*Fr.*) Mastix, (*Ger.*) Mastice, (*It.*)

Med. use.—It is principally used by the Turkish women as a masticatory, to preserve the teeth, and to give a pleasant smell to the breath.

PIX BURGUNDICA. *Dub.* See PINUS ABIES.

PIX LIQUIDA. Ex speciebus pini diversis. *Dub.* See PINUS.

PLUMBUM. *Ed.*

Lead [*].

LEAD is obtained by various processes from its native sulphuret, *Galena.* In its metallic form it is scarcely an officinal article, as its different oxides are purchased from the manufacturers, and never prepared by the apothecary.

Lead is of a grey blue livid colour, streak grey, disagreeable taste and odour; specific gravity 11.358; soft; very laminable; hardens little under the hammer; very flexible; not very ductile; slightly tenacious; fusible at 612° Fahrenheit, and when slowly cooled, forming octohedral crystals; volatile at a red heat; tarnished in the air; slightly oxidized by air and water; burns when strongly ignited, and in oxygen with a brilliant white flame. It forms three oxides, protoxide yellow, deutoxide red, and peroxide brown, containing 8, 12 and 16 of oxygen to 104 metal. When heated in chlorine it unites with it, but it does not inflame. Its phosphuret and sulphuret are brittle; and it is oxidized by, and combines with the sulphuric, nitric, phosphoric, and other acids. Its oxide imparts to glass a uniform density, and strong refracting power.

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[*] *Syn.* Plomb, (*Fr.*) Bley, (*Ger.*) Piombo, (*It.*) Eeum, (*Tam.*) Sheesh, (*Duk.*) Sisa, (*Hind.*) Anak, (*Arab.*) Sheeshum, (*Tel.*) Surb, (*Pers.*) Tamaetam, (*Mal.*) Sisaka, (*Sans.*) Hih-yen, (*Chin.*)

OXIDUM PLUMBI SEMIVITREUM. *Ed. Lond. Dub.*

Semi-vitrified oxide of lead. Litharge *.

THE protoxide of lead, mixed with some deutoxide, is obtained by collecting the grey film which forms on the surface of melted lead, and in commerce is called *Massicot.* If oxidized lead be melted with a quick fire, it gets the appearance of oil, and on cooling concretes into *Litharge.* Greatest part of the litharge met with in the shops is produced in the purification of silver from lead, and the refining of gold and silver by means of this metal. According to the degree of fire and state of oxidation, it has a pale or deep colour; the one has been commonly called Litharge of silver, the other Litharge of gold. It occurs in small, shining, heavy scales, or more or less agglutinated masses. It should be entirely soluble in acetic acid, and its solution should acquire a blue colour from liquid ammonia, which indicates the presence of copper. It is also dissolved in fixed oils by boiling.

Off. Prep.—Plumbi subacetatis liquor, *D. L.* Emplastrum lithargyri, *D. L. E.* Ceratum saponis, *L.*

PLUMBI SUB-CARBONAS, S. S. Sub-carbonas plumbi. *Lond.*
CARBONAS PLUMBI, *Dub. vulgo* Cerussa, *Ed.*

Ceruse. White lead. Carbonate of lead. Sub-carbonate of lead †.

THIS substance is prepared by exposing lead to the vapour of vinegar. To accelerate the oxidizement, the lead is cast in thin plates, which are rolled up spirally. A number of these are placed perpendicularly on a support, over a flat vessel containing vinegar, which is converted into vapour by a gentle heat, such as that of dung. The plates become slowly covered with a white crust, which is in due time removed; and the remains of the plates are again exposed to the vapour of vinegar, until they be entirely corroded.

White oxide of lead has a scaly or foliated texture, is brittle, friable, heavy, of a snowy whiteness. It is often adulterated with earthy substances, which may be discovered by mixing it with oil, and reducing the lead in a crucible. Although very friable, the coarser particles cannot be separated by means of a sieve, because its interstices soon get filled up.

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* *Syn.* Litharge, (*Fr.*) Bleyglatte, (*Ger.*) Piombo semivitreio, (*It.*) Marudar singhie, (*Tam.*) Moordar sang, (*Pers. Duk. Hind.*)

† *Syn.* Plomb carbonaté, (*Fr.*) Bleyweisse, (*Ger.*) Cerussa, (*It.*) Vullay, Morthoo vullay, (*Tam.*) Suffidah, (*Duk. Pers. Hind.*) Asfidaj, (*Arab.*) Seebaydoo, (*Tel.*)

It can only be obtained in the state of a fine powder, by rubbing a loaf of ceruse on a sieve placed over a sheet of paper. It consists of 112 oxide of lead, and 22 carbonic acid.

Off. Prep.—Plumbi acetas, *D. L. E.* Unguentum cerussæ, *E.*

OXIDUM PLUMBI RUBRUM. *Ed.*

Red oxide of lead. Red lead *.

THE preparation of red lead is so troublesome and tedious, that the preparation of it forms a distinct branch of business. The manufacturers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built for this purpose, and so contrived, that the flame acts upon a large surface of the metal, which is continually changed by means of iron rakes drawn backwards and forwards, till the fluidity of the lead is destroyed; after which, the oxide is only now and then turned. It is the deutoxide, and contains lead 104, oxygen 12.

The red oxide of lead is obtained in the form of a very heavy powder, consisting of minute shining scales, of a bright scarlet, verging towards yellow, especially if triturated. It is sometimes adulterated with red oxide of iron, red bole, or powdered brick. These frauds are detected by the inferiority of colour, by mixing it with oil, and subjecting it to the test of reduction; and by its forming a black precipitate with tincture of galls, when dissolved in nitrous acid.

Med. use.—Lead and its insoluble compounds have no very energetic action on the body. In solution its effects are emaciation, violent colics, paralysis, tremors, and contractions of the limbs; and as they generally come on gradually, the cause is sometimes overlooked till it be too late. Poisoning from lead is never intentional, but only accidental, either from liquors becoming impregnated with lead, by being improperly kept in vessels lined or glazed with lead, or by having lead criminally added to them to correct their acidity; or among manufacturers who work much with lead, as painters and plumbers, and who are not sufficiently attentive to avoid swallowing it. According to the experiments of Dr Christison, distilled water becomes poisonous by being left in contact with lead; but water containing salts, whose acid forms an insoluble salt with lead, may be kept in it with impunity.

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* *Syn.* Minium, (*Fr.*) Mennig, (*Ger.*) Minio, (*It.*) Segapoo sendooerum; Eeum sindoorum, (*Tam.*) Sendour, (*Duk.*) Sindur, (*Hind.*) Isrenj, (*Arab.*) Sindura, (*Sans.*) Yerra sindooṛum, (*Tel.*) Temamera, (*Mal.*) Yuen-tan, (*Chin.*)

The presence of lead in any suspected liquor is detected by sulphuretted hydrogen, which forms with it a brown or black precipitate, not soluble in diluted muriatic acid; and still more certainly, by evaporating a portion of the liquor to dryness, and exposing the extract to a heat sufficient to reduce the lead.

The oxides of lead dissolved in oils are supposed to be (when externally applied) anti-inflammatory and desiccative. Combined with vegetable acids, they are remarkably so; and taken internally, they prove powerful, though dangerous styptics.

POLYGALA SENEGA. *Ed. Lond. Dub.*

Willd. *g.* 1313, *sp.* 67; Spr. *g.* 2487, *sp.* 103. *Diadelphia Octandria.*—Nat. ord. *Lomentaceæ*, Linn., *Polygaleæ*, Juss.

Seneka, or Rattlesnake root *.

Off.—The root.

RADIX. *Ed. Lond. Dub.*

SENEKA is a perennial plant indigenous in North America, particularly Virginia and Pennsylvania. The root is usually about the thickness of the little finger, variously bent and contorted, and appears as if composed of joints, whence it is supposed to resemble the tail of the animal whose name it bears; a kind of membranous margin runs on each side the whole length of the root.

The bark is the active part of the root. Its taste is at first acrid, afterwards very hot and pungent. It has no smell.

Snake root has been analyzed by Feneulle, Dulong d'Astafort and Gehlen. The alcoholic extract treated with water yields a sweetish unpleasant acrid substance, which has been called Sengine or Polygaline.

Med. use.—It is an active stimulus, and increases the force of the circulation, especially of the pulmonary exhalants. It has therefore been found useful in typhoid inflammations of the lungs; but it is apt to disorder the stomach, and to induce diarrhœa. Dr Brandreth of Liverpool derived great benefit in some cases of lethargy from an extract of seneka combined with carbonate of ammonia.

Some have likewise employed this root in hydropic cases, and not without success. There are examples of its occasioning a plentiful evacuation by stool, urine, and perspiration; and by this means removing the disease, after the common diuretics and hydragogues had failed.

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* *Syn.* Polygale de Virginie, (*Fr.*) Klapperschlangenwurzel, (*Ger.*)

The Senegaro Indians are said to prevent the fatal effects of the bite of the rattlesnake, by giving it internally, and by applying it externally to the wound.

The usual dose of the powder is 30 grains or more.

The decoction has been advantageously used as a stimulating gargle in croup.

Off. Prep.—Decoct. senegæ, *D. E.*

POLYGONUM BISTORTA. *Ed. Lond. Dub.*

Willd. *g.* 785, *sp.* 3; Spr. *g.* 1510, *sp.* 1; Smith, *g.* 196, *sp.* 6. *Octandria Trigynia.*—Nat. ord. *Oleraceæ*, Linn., *Polygoneæ*, Juss.

Great bistort, or snakeweed *.

Off.—The root.

RADIX. *Ed. Lond. Dub.*

BISTORT is perennial, and grows wild in moist meadows in several parts of Britain. It flowers in June. The root is about the thickness of the little finger, of a blackish-brown colour on the outside, and reddish within; it is not straight, but reflected or bent (whence the name of the plant,) with a joint at each bending, and full of bushy fibres. All the parts of bistort have a rough austere taste, particularly the root, which is one of the strongest of the vegetable astringents.

Med. use.—It is employed in hæmorrhagies and other fluxes, both internally and externally, where astringency alone is indicated. To the sudorific, antipestilential, and antiseptic virtues attributed to it, it has no other claim than what it derives from its astringency.

PORRI RADIX. *Lond.* See ALLIUM.

POTASSÆ SUB-CARBONAS IMPURUS, v. s. Anglice Pearl Aſhes. *Ed.*

POTASSA IMPURA, s. s. Sub-carbonas potassæ impura. *Lond. Dub.*

LIXIVUS CINIS, Anglice Potaſhes, Pearl Aſhes. *Dub.*

Pearl ashes. Potashes. Impure carbonate of potass. Fixed vegetable alkali †.

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* *Syn.* Polygone bistorte, (*Fr.*) Natter-knöterich, (*Ger.*) Bistorto, (*It.*)

† *Syn.* Cineres clavellati, (*Off.*) Kali carbonicum crudum, (*Ph. Bor.*) Cendres gravellées, (*Fr.*) Potasche, (*Ger.*) Potassa, (*It.*) Marra oopoo, (*Tam.*) Koharalavana, (*Sans.*) Hindee loonoo, (*Cyng.*) Manie oopoo, (*Tel.*) Ihar ka nemuck, (*Duk.*)

The potashes of commerce are sent to us from the shores of the Baltic and from America. They are prepared by lixiviating the ashes of vegetables in barrels, first with cold, and then with hot water, filtering the ley, and evaporating it to dryness in an iron pot. In this state they still contain some vegetable matter, not perfectly incinerated, which gives them a brown or black colour. To destroy this, and render their colour purer, they are put into a crucible and liquefied in an intense heat. The melted matter is poured out on iron plates, where it hardens. It now gets the name of pearl ashes; but even yet it is very impure, and often contains the sulphates of potass and of lime, and the muriate of potass. It is also frequently adulterated with vegetable ashes, sand and sulphate of potass. The ashes are detected by their difficult and imperfect solution; the sand, by the precipitation of silica in a gelatinous form on the addition of an acid, and the sulphate of potass by its crystallization.

Pearl ashes are shapeless, cavernous, hard, saline masses, of a whitish or pale bluish-grey colour, of a somewhat caustic alkaline taste, no smell, very deliquescent, and almost totally soluble in water. The best are obtained from the ashes of hard wood, and in northern climates. They must be kept in close vessels.

All vegetables which grow at a distance from the sea afford potashes by incineration: herbs give the largest proportion, then the leaves of trees, then shrubs, and woods the least. The alkali, thus obtained, formerly had the name of Fixed Vegetable Alkali; but it is also found, though much more sparingly, both in the animal and mineral kingdoms.

Pearl ashes may be purified sufficiently for pharmaceutical purposes, by lixiviating them with a small proportion of cold water, and evaporating the ley to dryness in an iron pot.

Med. use.—Carbonate of potass is useful in all diseases depending upon the presence of an acid in the primæ viæ, by neutralizing it, and forming with it an aperient salt. Hence Dr Mitchell strongly recommends the use of potash cakes to infants, in order to counteract the acidity of their bowels. Alkalies are by many supposed to attenuate the fluids, remove obstructions, and promote the natural secretions. Weak solutions of alkalies prove diuretic, or, if assisted by warmth, diaphoretic. In large doses, potash has been given as a lithontripic; but its long continued use, necessary in calculous complaints, seldom fails to injure the intestinal canal and constitution. Dr Mitchell strongly recommends alkalies in fevers and dysenteries. Administered by the mouth, they are supposed to neutralize the septic acid in their passage through the bowels. Injected in clysters, they are said to allay tenesmus like a charm, and in both cases to mitigate pain, moderate spasmodic action, and restore and equalize the peristaltic motion; moreover, effectually to destroy the fetor and infection of the stools. The effects of alkalies upon the irritability in galvanic experiments led to their use, alternated with the free exhibition of opium, in tetanic and other spasmodic diseases. Externally alkalies are used in form of lotion, in rachitic and some cutaneous diseases, and as a stimulant to the inactive state of the vessels in certain ulcers.

Off. Prep.—Potassæ causticæ aqua, *D.* Potassæ carbonas e lixivo cinere, *D.* Sub-carbonas potassæ, *E. L.* Alcohol, *D.*

POTASSÆ NITRAS, S. S. Nitras potassæ purificata. *Lond.*

POTASSÆ NITRAS. *Ed. Dub.*

Nitrate of potass. Purified nitre. Saltpetre *.

NITRATE of potass is annually produced on the surface of the earth in many countries. For this production, the presence of felspar to furnish the alkali, and carbonate of lime, and an open, but not too free communication with dry atmospheric air, are requisite. The putrefaction of organic, especially animal, substances is not essential, but it accelerates the formation of this salt, by affording the nitrogen in a state in which it combines readily with the oxygen of the atmosphere, and forms the nitric acid. Accordingly, in Germany and France, nitrate of potass is prepared, by exposing mixtures of putrefying animal and vegetable substances, and calcareous earths, to the action of the atmosphere. The salt is afterwards extracted by lixiviation and crystallization.

The nitre used in this country is chiefly imported from the East Indies. As it occurs in commerce, it often contains a little muriate of potass and muriate of soda, from which it is nearly purified by dissolving it in boiling water, and filtering it; on cooling, the nitrate of potass crystallizes, and the other salts remain dissolved.

Nitrate of potass has a sharp, bitterish, cooling taste. It shoots in pretty large crystals, which are generally six-sided prisms, terminated by six-sided pyramids; very brittle; permanent in the atmosphere; soluble in seven times their weight of water at 60°, and in an equal weight at 212°; melting when exposed to a strong heat, giving out at first oxygen, and afterwards nitrogen gas, until the whole acid be decomposed, and the potass alone remain behind. It deflagrates more or less violently with all oxygenizable substances, oxidizing or acidifying them. Nitre is an anhydrous salt. Any water which it may contain is only interposed among the molecules of its crystals. It consists of nitric acid 6.75, potash 6 = 12.75. It is decomposed by the sulphuric acid and baryta, by the muriate and acetate of baryta, and the sulphate of soda, ammonia, magnesia and alumina.

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* *Syn.* Nitre, (*Fr.*) Saltpeter, (*Ger.*) Nitro, (*It.*) Potti-loopoo, (*Tam. Tel.*) Shorak, (*Pers. Duk.*) Bajee, (*Hindooie.*) Sandawa, Masiu mentah, (*Mal.*) Ubkir, (*Arab.*) Yava-kshara, (*Sans.*) Wedie loonoo, (*Cyng.*)

Med. use.—Taken to the extent of from a drachm to three drachms in the course of a day, in repeated doses, it diminishes the heat of the body, and the frequency of the pulse, operates by stool, and acts upon the secretion of urine, but is apt to produce pains in the stomach. In large doses, such as an ounce, taken at one time, it produces the most dreadful symptoms, constant bloody vomiting, purging, convulsions, and death. Accidents of this kind have happened, from its being sold, by mistake, for sulphate of soda.

It is best given in small doses, as from five to ten grains, frequently repeated, and is only admissible in inflammatory diseases. Externally it is used in gargles for inflammatory sore throats.

Off. Prep.—Potassæ nitras purificatum, *D.* Potassæ sulphas, *D. E. L.* Potassæ supersulphas, *L.* Sulphas potassæ cum sulphure, *E.* Acidum nitricum, *D. E. L.*

POTASSÆ SULPHAS. *Lond.*

Sulphate of potash [*].

THE London College have now introduced this salt into the Materia Medica, as an article which may be purchased; but they have also retained the formula for its preparation, to which we refer.

Sulphate of potass forms small, transparent, very hard crystals of different forms, generally aggregated in crusts, and permanent in the air. It has a bitter taste, is slowly soluble in water, requiring 16 waters at 60°, and 4 at 212°. It is not soluble in alcohol. It decrepitates when thrown on live coals, and melts in a red heat.

It is an anhydrous salt, and consists of 5 dry sulphuric acid, and 6 of potassa, = 11 sulphate of potassa. It is decomposed by the barytic salts; by the nitrates and muriates of lime and of strontia; by the tartrates partially; and by the salts of mercury, silver, and lead.

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[*] *Syn.* Arcunum duplicatum, (*Off.*) Sulphate de potasse, (*Fr.*) Doppelsalz, (*Ger.*) Solfato di potassa, (*It.*)

Med. use.—Sulphate of potass, in small doses, as a scruple or half a drachm, is an useful aperient; in larger ones, as four or five drachms, a mild cathartic, which does not pass off so hastily as the sulphate of soda, and seems to extend its action farther.

Off. Prep.—Pulvis ipecac. comp. *D. L. E.* Pulvis salinus comp. *D. E.* Pilulæ colocynth. comp. *D. E.*

SUPER-TARTRAS POTASSÆ IMPURUS. *Ed.* TARTARUM, S. S. Potassæ super-tartras impura. *Lond.* TARTARUM. *Dub.*

Impure super-tartrate of potass. Tartar *.

POTASSÆ SUPER-TARTRAS, S. S. Super-tartras potassæ purificata. *Lond.* SUPER-TARTRAS POTASSÆ. *Ed.* POTASSÆ BITARTRAS. CRYSTALLI TARTARI. *Dub.*

Super-tartrate of potass. Crystals of tartar, and Cream of tartar †.

TARTAR exists in verjuice and in must, and is gradually deposited on the sides of the casks in which the wine is made, from which it is scraped before the next vintage, to prepare the casks to receive the new wine. The deepest coloured and roughest wines generally give most tartar; and it gets the name of white or red tartar according to its colour.

It is purified by dissolving it in boiling water, and filtrating the boiling solution, which, on cooling, deposites irregular crystals, containing the oily and colouring matters. These are separated by boiling the crystals with a white clay. At Venice, they are purified by dissolving them in water, and clarifying them with whites of eggs and ashes. The tartar, thus purified, when crystallized, or in powder, is called Cream of tartar.

Its crystals are small and irregular, and do not melt in the mouth, but feel gritty under the teeth. It has an acid harsh taste. It is soluble in sixty times its weight of water at 60°, and in thirty at 212°. It is decomposed, and its acid is destroyed by heat. Its constituents are 16.5 acid, 6 potass, 2.25 water = 24.75.

Med. use.—The crystals of tartar are a mild, cooling, aperient, laxative medicine. It is much used in dropsy; and some allege, that it has good effects as a deobstruent in dropsy from scirrhus. Taken from half an ounce to an ounce, it proves a gentle, though effectual purgative. Given in smaller doses, and in solution, it often acts as a powerful diuretic.

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* *Syn.* Tartre cru, blanc et rouge, (*Fr.*) Roher Weinstein, (*Ger.*) Tartaro volgare, (*It.*)

† *Syn.* Crème de tartre, (*Fr.*) Weinstein-rahm, (*Ger.*) Tartaro purgato, (*It.*)

Off. Prep.—Acidum tartaricum, *D. L.* Potassæ carbonas e tartari crystallis, *D. E.* Potassæ tartras, *D. L. E.* Sodæ et potassæ tartras, *D. L.* Ferri tartarum, *D. L. E.* Pulvis jalapæ comp. *D. L.* Antimonium tartarizatum, *L. E. D.*

PRUNUS.

Willd. *g.* 982; Spr. *g.* 1816.—Nat. ord. *Icosandria Monogynia*, Linn., *Rosaceæ*, sect. *Pomaceæ*, Juss.

Sp. 27. Willd.; *sp.* 9. Spr. *Prunus Domestica. Ed. Lond. Dub.*

Plum tree.

Off.—The dried fruit called French prunes [*].

FRUCTUS. *Ed.* FRUCTUS SICCATUS. *Dub.* PRUNA; Drupæ exsiccatæ. *Lond.*

THIS tree is found wild in hedges in England, but has probably originated from the stones of the cultivated kinds being dropt there by accident. It flowers in April. Great quantities of the dried fruit are imported from the Continent, of which the French prunes, *Prunes de Saint Julien*, are reckoned the best.

They contain much mucilaginous and saccharine matter. A spirit is distilled from them in Germany, and M. Bonneberg extracted a crystallized sugar from them.

Med. use.—They are demulcent, and gently loosen the belly, which they perform by lubricating the passages, and softening the excrement. They are of considerable service in costiveness, accompanied with heat or irritation, which the more stimulating cathartics would tend to aggravate. Where prunes are not of themselves sufficient, their action may be promoted by joining with them a little rhubarb, or jalap, to which may be added some carminative ingredient, to prevent their occasioning flatulency.

Off. Prep.—Electuarium sennæ, *D. L. E.*

Sp. 46. Spr. PRUNUS LAUROCERASUS. *Dub.*

Cherry laurel [†]

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[*] *Syn.* Κοκκυμηλιὰ, (*Dios.*) Prunes, (*Fr.*) Gedorrte Pflaumen, (*Ger.*) Pruni, (*It.*)

[†] *Syn.* Δαφνεῖδες, (*Lacon.*) Laurier cerise, (*Fr.*) Lorbeerkirsche, (*Ger.*) Lauro di Trabesonda, (*It.*)

FOLIA. *Dub.*

THE cherry laurel, *Cerasus laurocerasus* Lois, is originally from Trebizond, but is cultivated very commonly in this country, reaches to a very considerable size, and produces ripe fruit, which is eaten greedily by birds. Its leaves are evergreen, have short round petioles, sulcated, coriaceous, oval, oblong, pointed, from five to seven inches long, finely toothed on the edge, smooth, shining, and of a deep green on the upper surface, greyer beneath, with oblique sub-opposite nerves. When recent and entire they have no smell, but on being bruised they have a strong kernel smell, and a slightly styptic and intensely bitter taste. When dried they lose their colour, and become almost insipid. In their recent state, they have been long known to have deleterious effects, and Bergius obtained a volatile oil from them. Schrader, in 1802, shewed that they contained hydrocyanic acid. The oil is very analogous to that of bitter almonds, and is sold under its name, for the use of perfumers and rectifiers, who imitate with it the liquor called *Noyeau.* The recent leaves are also boiled in cream, to give it the flavour of *ratafia,* but on some persons the smallest quantity acts unpleasantly, producing *urticaria.*

Med. use.—A water is distilled from the recent leaves which is used as a substitute for the hydrocyanic acid, and seems in many respects preferable, as being less liable to decomposition, and less dangerous. With Hufeland it is a favourite remedy. He gives 20 drops of the simple water every two hours, increasing the dose to 60; and the cohobated water in doses of 10 drops. He says he has seen narcotic effects from 30 drops of the former, when the dose was given too frequently. On the other hand, Fouquier and Richard gave 4, 6, 8, 12 ounces without any effect! These contradictory reports it is not easy to explain, but I would not, with Dierbach, draw from them a conclusion against the state of pharmacy in France. My experience coincides with that of Hufeland, and laurel-water ought always to be begun in doses of a few drops. Prof. Taddei recommends a solution of the cherry laurel oil in olive oil, as the most effectual and safest means of obtaining the sedative effects.

The fresh leaves were used by Dr Cheston as an external application in cancerous ulcers. He infused four ounces in two pounds of boiling water, and dissolved in the liquor four ounces of honey. This was applied on linen.

Off. Prep.—Aqua laurocerasi, *D.*

PTEROCARPUS.

Willd. *g.* 1318; Spr. *g.* 2510. *Diadelphia Decandria.*—Nat. ord. *Papilionaceæ,* Linn., *Leguminosæ,* sect. *Papilionaceæ,* Juss.

Sp. 6; Spr. *sp.* 2. PTEROCARPUS SANTALINUS. *Ed. Lond. Dub.*

Off.—Red Saunders wood *.

LIGNUM. *Ed. Lond. Dub.*

THIS tree grows in the East Indies, and acquires a very large size. The wood is brought in large billets, of a compact texture, a dull red, almost blackish colour on the outside, and a deep brighter red within. It has no manifest smell, and little or no taste. It communicates a deep red to alcohol, but gives no tinge to water. M. Pelletier separated the colouring matter, *santaline,* which he found to have great analogy with the resins; it is insoluble in water; soluble in alcohol, ether, acetic acid and alkaline solutions; it forms beautifully coloured precipitates with many metallic solutions. Its acetic solution acts like tannine upon gelatine. It contains no azote.

Off. Prep.—Tinct. lavandulæ comp. *D. L. E.*

Sp. 1; Spr. *sp.* 10. PTEROCARPUS DRACO. *Ed.*

Off.—The resin called Dragon's blood †.

RESINA. *Ed.*

THIS is also a very large tree. It is a native of South America. Hayne says, that although the resin of the *Pt. draco* was formerly sent in abundance from Carthagena to Spain, it no longer occurs in commerce, on account of the decreased demand for dragon's blood, and that the dragon's blood of commerce comes chiefly from the *Calamus draco* of the East Indies, and also from *C. verus* and *C. rudentum.* It is obtained from their fruit, which, when fully ripe, is covered with a crust of a red resinous substance. This is separated by stamping them gently in a mill, or shaking them in a sac, and is then formed by the assistance of heat into balls about the size of a nutmeg; or it may be got by steaming and boiling the fruit in water. The balls are put up in the cases woven of the leaves of the *Licuala spinosa,* and the most esteemed are the *S. D. in guttis.* It also occurs in cylindrical rolls, put up in the same manner. A second sort is in larger or smaller fragments, and is called *S. D. in granis,* and is often finer and better than the preceding. A third sort, *in placentis,* in cakes of several ounces weight, is got by boiling the bruised fruit after the former kinds have been separated; and a fourth, *in tabulis,* is a sophisticated mixture of colophony, powdered red saunders, with a little true dragon's blood.

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* *Syn.* Santale rouge, (*Fr.*) Sandelholz, (*Ger.*) Sandalo roseo, (*It.*) Segapoo shandanum, (*Tam.*) Lal chundend, (*Duk.*) Sundul ahmer, (*Arab.*) Ruchut chundun, (*Hind.*) Sundul soorkh, (*Pers.*) Kuchandana, Tilaparni, Ranjána, Ratka-chundana, (*Sans.*) Ruct handoon, (*Cyn.*) Honnay, (*Can.*) Kuchandanum, (*Tel.*) Rachta chandana, (*Beng.*) Undum, (*Hindooie,*) Buckum, (*Pers.*)

† *Syn.* Sang-dragon, (*Fr.*) Drachenbluth, (*Ger.*) Sangue di dracone, (*It.*) Kandamoorgarittum, (*Tam.*) Catgamoorgum nitorroo, (*Tel.*) Catukamrigarakta, (*Sans.*) Donnulakwhain, (*Arab. Duk.*) Idarumie, (*Arab.*) Khemisyawashan. (*Pers.*) Heraduky, (*Hind.*) Jaremang, (*Palembang.*)

This drug, in substance, has no sensible smell or taste; when dissolved, it discovers some degree of warmth and pungency. It is fusible and inflammable, and almost totally soluble in alcohol, tinging a large quantity of the menstruum of a deep red colour. It is likewise soluble in expressed oils, and gives them a red hue, less beautiful than that communicated by Anchusa. It is not acted upon by water, but precipitated by it from its alcoholic solution. I found that it is soluble in nitrous acid and alkalies, and that it neither precipitates gelatine, nor affects the colour of the salts of iron. It therefore appears to be a pure resin, without any astringency. The same conclusion has since been made by Melandri, by whom dragon's blood has been lately analyzed, and found to consist chiefly of a new alkaloid, which he has named *Draconine.* He prepares it by decomposing the tincture acidulated with sulphuric acid by water, and washing well with water the precipitate, with is sulphate of draconine. This is a red uncrystallizable mass, very sparingly soluble in water, more soluble in alcohol, and easily decomposed by alkalies. It melts at a gentle heat, and when decomposed seems to contain no nitrogen. *Sanguis draconis in placentis* consisted almost entirely of draconine, but that *in guttis* or *lachrymis* contained little.

Sp. PTEROCARPUS ERINACEA. *Encycl. Method.* Extractum. *Lond.*

Off.—The concrete juice.

KINO.

SOME account of this tree has already been introduced under the article *Kino,* p. 487. It is common near Kacundy, and other mountainous places on the west of Africa, and flowers in the month of December. When an incision is made, the juice flows out, at first of an extremely pale red colour, and in a very liquid state; but it soon coagulates, becoming of a deep red hue, and so remarkably brittle, that its collection is attended with some difficulty. It may be concluded almost with certainty that this concrete juice was the original kino noticed by Dr Fothergill, who received it as a very fine variety of dragon's blood; and, although dragon's blood is entirely resinous, and this kino entirely astringent, yet the account is so far correct, that they are both furnished by species of the same genus, and that they agree in their intensely red colour.

PULEGIUM. *Lond. Dub.* See MENTHA.

PUNICA GRANATUM. *Ed. Lond. Dub.*

Willd. *g.* 980; Spr. *g.* 1828, *sp.* 1. *Icosandria Monogynia.*—Nat. ord. *Pomaceæ,* Linn., *Myrtineæ,* Juss.

Pomegranate tree [*].

Off.—Pomegranate bark. The double flowers, called Balaustine.

a) GRANATI CORTEX [†]. Pomorum cortex. *Lond.* BACCÆ TUNICA EXTERIOR.

b) RADICIS CORTEX. *Dub.*

c) FLORES [‡]. *Dub.*

THE pomegranate is a low tree, growing wild in Italy and other countries in the south of Europe. It is sometimes met with in our gardens, but scarcely indures this climate.

The fruit [§] has been known from the most remote ages. It is mentioned by Moses, as one of the most prized in Egypt and the Land of Promise; and in the Song of Solomon we learn that wine was made of its juice. According to Hayne, it has most botanical analogy with the pumpkin. It is about the size of a small orange, with a hard yellow-brown rind and a pale red pulp, in which are imbedded many seeds. The pulp of the fruit is subacid, and sweetish with some astringency.

The flowers have a fine red colour, and somewhat resemble dried double red roses. Their taste is bitterish, and powerfully astringent.

The dried rind of the fruit is yellowish-brown, hard, coriaceous, without smell, and of a bitterish very astringent taste. It yielded to Reuss of tannin, 60; mucus, 74; resin, 2; oxidized tannin, 22; extractive, 45=216.

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[*] *Syn.* Ροα, (*Dios. Theoph.*) Punicum malum, Malum granatum, (*Off.*) Grenadier, (*Fr.*) Granat-baum, (*Ger.*) Melogranato, (*It.*) Magilam palam, (*Tam.*) Anar, (*Pers. Hind. Duk.*) Rana, Roman, (*Arab.*) Darim, (*Hindooie.*) Dadima pundoo, (*Tel.*) Dadima, (*Sans.*) Dalema, Daime, (*Mal.*) Gangsalan, (*Jav.*) Delunghedie, (*Cyn.*) Daleemb, (*Mah.*) Nar, (*Turkish,*) Sheh-lew, (*Chin.*)

[†] *Syn.* Malicorium, (*Off.*)

[‡] *Syn.* Balaustium, (*Off.*) Βαλαυστιον, (*Gr.*)

[§] *Syn.* Σιδη.

The bark of the root is yellowish-grey, an ash-grey externally, internally yellow without smell, and of a bitter taste without astringency.

M. Mitouart found the root to contain tannin, a matter analogous to wax, a saccharine substance, of which one part is soluble in alcohol, the other in water; of these the former is crystalline, and the second has the characters of mannite; and lastly gallic acid in very notable proportion: but the principle to which it owes its specific virtues seems to have escaped his observations. Bonastre got also a volatile oil, like cajeput.

Med. use.—The flowers are used externally in decoction or infusion, as gargles or lotions, and internally in ptisans or glysters in diarrhœa.

The pulp or juice of the fruit is used for allaying heat, quenching thirst, and loosening the belly in febrile diseases.

The rind of the fruit has been recommended in ague. They are even used in some places for tanning leather. Its efficacy against the tape worm was known to the ancients, and has been confirmed by recent observations. For its introduction into modern practice, we are indebted to a Mussulman Fakir of Calcutta. Having in a few hours relieved an English gentleman in 1804, he was prevailed on to disclose his secret, which was then communicated by Mr Russel for general information. The first printed notice is by the late Dr F. Hamilton, formerly Buchanan.

The following is Mr Breton's mode of exhibiting it. Take two ounces of the dried root of the pomegranate tree, boil them in two pints of water down to twelve ounces. Of this decoction two ounces to be given every half hour. The worm is often voided twelve hours after the first quantity has been taken. This practice may be repeated for four or five days successively, but must be suspended if the patient feels vertigos, an uneasy state and pains in the intestines. Castor oil is commonly given after the four draughts, even when the worm has been voided.

The recent root, and of the wild pomegranate is preferable, although even the bark of the trunks and branches will succeed.

PYRETHRUM. *Lond. Dub.* See ANTHEMIS.

PYROLA UMBELLATA. *Dub.*

Willd. *g.* *Chimaphylla umbellata* ; Spr. *g.* 1575 ; *sp.* 1. *Decandria monogynia.*—Nat. ord. *Ericineæ,* Juss.

Winter green[*]. The herb.

Off.—HERBA. *Dub.*

This humble, though beautiful evergreen, is extensively diffused through the northern hemisphere, both in the new and old worlds. It grows only in shady woods. The plant has been accurately described by Professor Bigelow, from whom what relates to its pharmography is transcribed. The stems are ascending, somewhat angular, and marked with the scars of former leaves. The leaves grow in irregular whorls, of which there are from one to four. They are evergreen, coriaceous, or very short petioles, wedge-shaped, subacute, serrate, smooth, shining, the lower surface somewhat paler. The taste of the leaves is both sweet and bitter. The roots and stalks in addition have a moderate degree of astringency.

It was analyzed by Dr Wolf, who found 18 of a bitter extractive ; 2.04 of resin ; 1.38 of tannin, and the remainder fibre and earthy salts = 100. The extractive is adhesive, brownish, readily soluble in ether and alkalies, burning with a flame and a resinous odour, and leaving a white cinder. The tincture is scarcely rendered turbid by water. Mr Carter got pounds of extract from thirty-four of the recent herb.

Med. use.—It seems to have long been an Indian remedy in rheumatism and fever. A strong decoction taken warm seldom fails to excite copious perspiration. It is also given in cold infusion, as a palliative, in strangury and nephritis. Dr Somerville has related some cases of its success, as a diuretic, in dropsy ; and it had the advantage of not disturbing the stomach. He gave the infusion to the quantity of a pint daily, or of the extract as much as five scruples in the day. It is also applied externally, in the form of decoction or cataplasm, in tumors and ulcers.

PYRUS CYDONIA. *Lond.*

Willd. *g.* 992, *sp.* 17; Spr. *g.* 1857, *sp.* 18. *Icosandria Pentagynia.*—Nat. ord. *Pomaceæ,* Linn., *Rosaceæ,* sect. *Pomaceæ,* Juss.

Off.—Quince seeds[†].

SEMINA CYDONIÆ. *Lond.*

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[*] *Syn.* Pippissewa, (*Indian.*) Herbe de paigné, Herbe à pisser, (*Fr.*)

[†] *Syn.* Κυδωνια μηλα, (*Dios.*) Grains de coing, (*Fr.*) Quittenkorne, (*Ger.*) Semi della Cotogna. (*It.*)

The quince is originally a native of Crete, but ripens its fruit perfectly in England, not in Scotland.

Quinces have a fine perfume, but a very austere acid taste. Taken in small quantity, they are supposed to restrain vomiting and alvine fluxes; and more liberally, to loosen the belly. The coat of the seeds, *episperm*, abounds with a mucilaginous substance, of no particular taste, which it readily imparts to watery liquors; an ounce of the seeds will render three pints of water thick and ropy, like the white of an egg. They will not, however, supply the place of gum arabic, because their mucilage spoils very quickly, and is precipitated by acids.

Off. Prep. Decoctum cydoniæ, *L.*

QUASSIA *.

Willd. *g.* 849; Spr. *g.* 1578, *Decandria Monogynia.*—Nat. ord. *Gruinales,* Linn., *Simarubeæ,* Juss.

Sp. 2.; Spr. *sp.* 3. QUASSIA SIMARUBA. *Ed. Lond. Dub.*

Mountain or bitter damson †.

Off.—The bark.

CORTEX. *Ed. Lond.* CORTEX RADICIS. *Dub.*

This tree grows in Guiana, and in the West India islands. De Candolle considers the *Quassia simaruba* of Wright as the same species with the *Simarouba amara* of Aublet. But Hayne still holds them to be different, as the latter is described as monoicous and the former as dioicous; and even he suggests that the former may yield the true, and the latter the spurious simarouba bark. The shops are supplied with the bark from Guiana. Descourtilz quotes Aublet as stating, that the negroes when stripping off the bark take the precaution to cover their bodies, to protect them from the acrid juice which springs from the root during this operation, and causes an intolerable itching with urtication of the skin; but Aublet says merely that during the decortication of the roots a whitish juice exudes. The simarouba of the shops is the bark of the root. It is brought to us in pieces some feet long, and some inches broad, folded lengthwise. It is light, fibrous, very tough; of a pale yellow on the inside; darker coloured, rough, scaly, and warted on the outside; has little smell, and a bitter, not disagreeable taste. It gives out its bitterness both to alcohol and water. M. Morin has found that it contains a resinous matter; a volatile oil having the smell of benzoin; acetate of potass; an ammoniacal salt; malic acid and traces of gallic acid; quassine; malate and oxalate of lime; some mineral salts, oxide of iron and silica; ulmine and lignine.

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* The genus *Quassia*, as constituted by Linnæus, included trees, some of which had hermaphrodite flowers, and others were monoicous, or polygamous. Decandolle in a monography separated them, retaining the name Quassia for the hermaphrodite species, of which the true *Quassia amara* is one, and giving the generic name *Simaruba* to the others, amongst which are both our officinal species, *Simaruba officinalis* and *Simaruba excelsa*.

† *Syn.* Simarouba, (*Fr.*) Ruhrbaum, (*Ger.*).

Med. use.—Simarouba bark was first brought to Europe in 1713, with the information that it was used by the inhabitants as a specific against dysentery. This was confirmed by the celebrated A. Jussieu in an epidemic which occurred in 1718. It has since been much celebrated in obstinate diarrhœa, dysentery, anorexia, indigestion, lienteria, and intermittent fevers.

It is given in powder, in doses of half a drachm, or a whole drachm; but it is too bulky, and very difficultly pulverizable. It is best exhibited in decoction. Two drachms of the bark may be boiled in two pounds of water to one, and the decoction drunk in cupfuls in the course of the day.

Off. Prep.—Infusum simaroubæ, *D. L.*

Sp. 3; Spr. *sp.* 2. QUASSIA EXCELSA. *Ed. Lond. Dub.*

Quassia tree.

Off.—The wood.

LIGNUM. *Ed. Lond. Dub.*

THE quassia of the shops is the wood of this lofty tree, which grows in Jamaica, and in the Caribæan islands.

It is brought in billets about the thickness of a man's arm; is very light, whitish, becoming yellowish by exposure to the air. Hayne agrees with Martius in thinking that the genuine quassia of Surinam is the *Quassia amara*, a diminutive tree or shrub, and that the officinal wood is now not from the root, but from the branches. Quassia wood has no sensible odour, but is one of the most intense and durable pure bitters known. Its infusion, decoction and tincture are almost equally bitter, are yellowish, and are not blackened by chalybeates. The properties of the extract of quassia have been detailed by Dr Thomson, under the title of the Bitter principle, since called *Quassine.*

Med. use.—It is a very pure and simple bitter, and may be given in all cases where bitters are proper. It has been exhibited in intermittent and bilious fevers, in stomachic complaints, in lienteria, in cachexy, dropsies, leucorrhœa and gout. It is much used in this country to give the bitterness to malt liquors, though it subjects those brewers who employ it to a very heavy penalty. It evidently has narcotic power, from its being used to poison flies.

It can scarcely be reduced to a sufficient fine powder to be given in substance, and is therefore generally given in the form of infusion, decoction, or extract.

Off. Prep.—Infusum quassiæ, *D. L.* Tinctura quassiæ, *D. E.*

QUERCUS.

Willd. *g.* 1692; Spr. *g.* 3124; Smith, *g.* 404. *Monœcia Polyandria.*—Nat. ord. *Amentaceæ,* Linn., *Cupuliferæ,* Juss.

Sp. 65. Willd.; Spr. *sp.* 101. QUERCUS PEDUNCULATA*. *Lond.*

Spr. *sp.* 100; *sp.* 1. Smith. QUERCUS ROBUR†. *Dub. Ed.*

Common British oak.

Off.—Oak bark.

CORTEX. *Ed. Lond. Dub.*

THE oak grows wild in Britain, and flowers in April. The superior excellence of its wood for ship-building has rendered its cultivation an object of national concern. Its sawdust is an useful dye-stuff, and its bark is the principal article used in tanning. M. Vauquelin has discovered a remarkable chemical difference between oak bark and nutgalls, the latter precipitating tartrate of antimony and infusion of cinchona, which are not acted on by the former.

Med. use.—Oak bark is a strong astringent, and is useful in hæmorrhagies, alvine fluxes, and other preternatural or immoderate secretions. It is so difficultly reduced to a sufficiently fine powder, that it can scarcely be given internally in substance. It is chiefly used externally in the form of decoction. Its extract is sometimes so prepared as to be sold for kino. Formerly the acorns and their cups were much used after being roasted and powdered.

Off. Prep.—Decoctum quercus, *D. L.* Extractum quercus, *D.*

Spr. *sp.* 38. QUERCUS INFECTORIA. *Dub.* See GALLÆ, p. 448.

RANUNCULUS. *Dub.*

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* *Syn.* Chêne à grappes, (*Fr.*) Stieleiche, Waldeiche, Sommereiche, (*Ger.*) Quercia, (*It.*)

† *Syn.* Chêne rouvre, (*Fr.*) Steineiche, Wintereiche, (*Ger.*) Rowero, (*It.*)

Willd. *g.* Spr. *g.* 2037; Smith, *g.* *Polyandria Polygynia.*—Nat. ord. *Rununculaceæ,* Juss.

Sp. Willd.; *sp.* 106, Spr.

RANUNCULUS ACRIS. *Dub.*

Upright meadow crow-foot. Butter-cups.

Off.—The leaves.

FOLIA. *Dub.*

THIS herb is very common in meadows and pastures. It varies much in size and pubescence. It is very acrid, and cows and horses leave it untouched, however bare their pasture may be.

Sp. Willd.; *sp.* 37, Spr.

RANUNCULUS FLAMMULA. *Dub.*

Lesser spearwort.

THIS species is also very common in bogs and by the sides of lakes and ditches. It is likewise extremely acrid, and rejected by animals.

Med. use.—The recent herb, bruised, is used as a rubefacient and vesicatory, and is employed by beggars to produce ulcers of a bad appearance. The distilled water is emetic, and Dr Withering recommends it, from his own experience, as preferable to any other emetic in cases of poisoning.

RHAMNUS CATHARTICUS. *Ed. Dub. Lond.*

Willd. *g.* 405, *sp.* 1; Smith, *g.* 105, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Dumosæ,* Linn., *Rhamneæ,* Juss.

Purging buckthorn *.

Off.—The berry. The juice of the berries.

a) BACCÆ. *Lond. Dub.*

b) SUCCUS EX BACCIS. *Ed.*

THIS tree or bush is common in hedges; it flowers in May and June, and ripens its fruit in September or the beginning of October. The berries, when recent, are about the size of a pea, green before they are ripe, and black when ripe, nearly round, a little flattened on the summit, smooth, shining, parenchyme juicy, green, becoming of a deep violet red, and surrounding four seeds, oval, obtuse, trigonal, brown, smooth and curvated. Their smell is unpleasant, and their taste nauseous and bitterish.

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* *Syn.* Spina cervina, (*Off.*) Noirprun, Nerprun purgatif, (*Fr.*) Stechdorn, *Berries,* Kreutzbeeren, (*Ger.*) Spino cervino, (*It.*)

In the market, the fruit of some other trees, as the blackberry bearing alder, *Rhamnus frangula*, and the dogberry tree, have been frequently mixed with, or substituted for those of buckthorn. This abuse may be discovered by opening the berries; those of buckthorn have almost always four seeds, of the alder two, and of the dogberry only one. Buckthorn berries, bruised on white paper, stain it of a green colour, which the others do not.

The juice when first expressed is green, but soon becomes red, in consequence of the formation of acetic acid by fermentation. Those who sell the juice to the apothecaries are said to mix it with a large proportion of water. Sap green is prepared by reducing it to an extract with the addition of an alkali.

Med. use.—Buckthorn berries have a faint disagreeable smell, and a nauseous bitter taste. They were long in considerable esteem as cathartics, and celebrated in dropsies, rheumatism, and even in the gout. They generally occasion gripes, and sickness, dry the mouth and throat, and leave a thirst of long duration. The dose is about twenty of the fresh berries in substance, and twice or thrice this number in decoction; an ounce of the expressed juice, or a drachm of the dried berries.

Off. Prep.—Syrupus rhamni, *D. L.*

RHATANIA. See KRAMERIA. *Dub.*

RHEUM.

Willd. *g.* 803. *Enneandria Trigynia.*—Nat. ord. *Oleraceæ*, Linn., *Polygoneæ*, Juss.

Sp. 3. RHEUM PALMATUM. *Lond. Dub.*

Palmated rhubarb.

Sp. 2. RHEUM UNDULATUM. *Dub.*

Undulated rhubarb.

RHÆI RADIX. RHEUM PALMATUM. Radix. *Lond.*
RHEUM PALMATUM ET R. UNDULATUM. Radix. *Dub.*
RADIX RHÆI. *Ed.*

a) RHEUM RUSSICUM *vel* TURCICUM. *Ed.*
b) RHEUM SINENSE *vel* INDICUM. *Ed.*
c) RHEUM BRITANNICUM. *Ed.*

Turkey or Russian, Chinese, and British rhubarb.

RHEUM is almost exclusively an Asiatic genus. With the exception of *Rh. rhaponticum*, or monk's rhubarb, all the species known are natives of the high table land, and lofty mountains which occupy the centre of Asia.

In fact, all the best rhubarb of commerce is brought by the Bucharians from the Chinese town Sinin or Selin. It is collected on the hills surrounding the lake Koko Norr, and at the source of the great river Chon-cho or Chong-choang. Mr Bell, in travelling from Petersburgh to Pekin, found on the hills near the rivulet Kana, E. longit. 105, N. lat. 46, the true rhubarb in abundance, but unfortunately he does not even attempt to give a description of the plant. As Mr Bell is, however, the most authentic source of information, I shall quote his account of the mode in which it is prepared for market. "This plant does not run and spread itself like docks and others of the same species, but grows in tufts at uncertain distances, as if the seeds had been dropt with design. It appears that the Mongalls never accounted it worth cultivating, but that the world is obliged to the marmots for the quantities scattered at random in many parts of the country; for whatever part of the seeds happens to be blown among the thick grass, can very seldom reach the ground, but must there wither and die; whereas, should it reach the loose earth thrown up by the marmots, it immediately takes root, and produces a new plant. After digging and gathering the rhubarb, the Mongalls cut the large roots into small pieces, in order to make them dry more readily. In the middle of every piece they scoop a hole, through which a cord is drawn, in order to suspend them in any convenient place. They hang them for the most part about their tents, and sometimes on the horns of their sheep. This is a most pernicious custom, as it destroys some of the best part of the root, for all about the hole is rotten and useless. Their gains are more considerable on this than on any other branch of trade." Sievers describes the preparation of the root somewhat differently. After being dug up by the peasants, they are cut into pieces, strung upon threads, and dried under sheds, so that the sun may not reach them. For this purpose sometimes a whole year is required until they can be finally dressed and exported. At the time when the commerce of the East was carried on through Natolia, the root thus prepared came to Europe entirely from the ports of Turkey, and hence got the name of Turkey rhubarb, which it still retains. It is also called Russian rhubarb, as the rest of Europe now receives it from Russia.

The plant which furnishes this root is still doubtful, or rather unknown; but a short sketch of the opinions of naturalists regarding it may not be uninteresting. In 1732 some plants said to be the true rhubarb were sent from Russia to Jussieu at Paris, and to Rand at Chelsea. These proved to be the *Rheum undulatum* of modern botanists. Some time afterwards Kaau Boërhaave procured from a Tartarian merchant seeds which he said were those of the plant whose root he sold. On sowing the seeds two species of *Rheum* were produced, the *undulatum*, already mentioned, and the *palmatum*. Dr Mounsey of Petersburgh also sent seeds to Dr Hope, which vegetated and were cultivated with great success in our botanic garden. These also proved to be the *R. palmatum*. Upon these authorities these two species have been generally indicated in the European Pharmacopœias as the source of the Asiatic rhubarb. But accurate naturalists were not altogether satisfied, and raised new scruples and doubts. When Pallas made inquiries in Bucharia, the natives declared that the leaves of the *R. palmatum* were unknown to them, and that the leaves of the true rhubarb plant were round, and with only a few incisions on the margin. Of the species known, this description agreed best with the *Rh. compactum*, but its roots are white, and hence it was called by Pallas *Leucorhizon*.

Moreover, the Russians themselves, from whom all these three species were obtained, were by no means satisfied that any of them produced the genuine rhubarb. In 1790 Sievers, an apothecary, went to Siberia under the auspices of Catherine II. chiefly with the view of promoting and improving the cultivation of the Siberian rhubarb. After four years of persevering attempts to reach the country where the true rhubarb grew, or even to obtain the seeds or plant, he concludes, in May 1794, "My travels, as well as my acquaintance with the Bucharians, have satisfied me that as yet nobody, that is no scientific person, has seen the true rhubarb plant. All that is said of it by the Jesuits is miserable confused stuff; all the seeds procured under the name of true rhubarb are false; all plantations, from those of the Knight Murray down to the flower-pot of a private individual, will never yield true rhubarb. Until further determination, I hereby declare all the descriptions in all the Materia Medicas to be incorrect." Mr Sievers was also informed that the plant did not grow tall, and that it had round leaves, toothed on the margin, with almost spinous points.

Very recently another species of rhubarb, found on the Himalayan mountains, has been supposed to produce the true rhubarb. It was first described by Mr Don. "*R. australe*, foliis subrotundo-cordatis obtusis planis subtus margineque scabris sinu baseos dilatatis, petiolis sulcatis teretiusculis cum ramis pedunculisque papilloso scabris, perianthii foliolis ovali oblongis apice crenulatis." He found it to be identical with the *Rh. Emodi* of Dr Wallich. It does not, however, appear to be the true rhubarb. At least the roots dried by our medical officers differ from the true rhubarb in appearance and power. The latest notice of the Himalayan rhubarb is by Mr Royle, superintendent of the botanical garden at Shaharunpore.

" By my plant collectors rhubarb has been found in large quantities on the Choor mountain, in lat. 30°, and at an elevation of about 9000 feet. There it has likewise been seen by Mr Gerard growing in rank luxuriance, also in vast beds on the hither slope of the Himalaya; and beyond them he has found the plant far more majestic, and the leaves larger and more spreading. The table land of Tartary, he informs me, is covered with rhubarb, at the height of 16,000 feet; and there is abundance of it at Ludak, in lat. 37°, from whence some of very fine quality was sent to Captain Kennedy by Mr Moorcroft; indeed it appears, that wherever travellers have been, there the rhubarb has been seen; and we may infer that it is to be found at the same latitude and elevation in all the intervening spaces."

There is a distinction made in commerce between the Russian and Chinese rhubarb, although they both come from the same country. The Russian rhubarb is dearer, and always good, as very great attention, both in purchasing and transporting it, is paid by order of the government. In Kiachta, on the Russian frontier, it is received from the Bucharians, by a Russian apothecary, who examines it. The bad is immediately burnt, and the good is freed from its bark, woody parts, and every impurity, in the most careful manner. It is then sent to Moscow and to Petersburgh, where it is again examined. It is commonly in round pieces, of a reddish or whitish-yellow colour, feels gritty between the teeth, and is often perforated with so large a hole, that many pieces have the appearance of a mere rind.

The Chinese or East Indian rhubarb is brought by sea from Canton. It is heavier, harder, and more compact than the other; seldom perforated with holes, and is either in long pieces, or with two flat sides, as if they had been compressed. Dr Lewis thinks that this is less aromatic, but stronger than the Turkey; and that it has required less care in drying, from having been lifted when the root was less watery.

The general characters of good rhubarb are, its having a whitish or clear yellow colour, being dry, solid, and compact, moderately heavy, brittle; when recently broken, appearing marked with yellow or reddish veins, mixed with white; being easily pulverizable; forming a powder of a fine bright yellow, having the peculiar, nauseous, aromatic smell of rhubarb, and a sub-acrid, bitterish, somewhat astringent taste, and when chewed feeling gritty under the teeth, speedily colouring the saliva, and not appearing very mucilaginous. The size and form of the pieces are of little consequence; only we must break the large ones, to see that they are not decayed or rotten within; and we must also observe that they are not musty or worm-eaten. This is the more necessary, as damaged pieces are frequently so artfully dressed up, and coloured with powder of rhubarb, as to impose on the buyer.

Rhubarb has been analyzed by many chemists. It contains some volatile odorous matter, on which its peculiar nauseous smell, and its activity as a purge, depend; for when dissipated, either by age or any preparation to which the rhubarb has been subjected, the purgative powers of the medicine are almost destroyed. Water dissolves almost all its active principles. The infusion is dark-red, and the residuum whitish, without smell or taste, and crackling under the teeth. When the watery extract is treated with alcohol, a proportion of white tasteless matter is left, having the properties of gum, while the tincture possesses all the distinctive peculiarities of rhubarb. The gritty matter, considered by Model to be sulphate of lime, was ascertained by Scheele to be oxalate of lime; and his conclusion has been verified by Heyer, Schrader and others; although Mr Brande was unable to find it in any specimen which he examined. Henry of Paris has also given a comparative result of the analysis of three kinds of rhubarb, Russian, Chinese, and French. The following table shews the result of the several analyses:

	Russian.			*Chinese.*	*Indigenous.*	
Resin,..................	10.	4.8	44	39.35	54.8	2.8
Extractive, ...	26.	26.4				24.
Gum,....................			5.5	6.	6.36	
Starch, ...	31.	12.8	4.8	12.86	17.432	14.8
Albumen ?........ ...				0.2		
Oxalate of lime, ...	—	4.5	29.98	32.8	10.522	9.
Phosphate of lime,...	2.					
Malate of lime, ...	6.5					
Lignine, ...	16.3	49.5	10.62	11.2	11.246	47.
Water, ...	8.2					

The 1st is by Mr Brande of London, the 2d and 6th by Schrader, and the 3d, 4th and 5th by Henry. Their discrepancies, which cannot be reconciled, shew the difficulty of the subject. The most important principle is that named in the table Extractive, but chemists are by no means agreed as to its nature. Mr Brande describes it, "Extract, tan, and gallic acid; Pfaff and Henry consider it as a principle; while Hornemann, more recently, is said to have discovered that it is a compound, containing, however, a proximate principle, to which he has given the name of *Rheumine.*"

M. Nani, an Italian apothecary, published that rhubarb contains a crystallizable vegetable alkali, of which he formed a sulphate. M. Caventou ascertained that this pretended sulphate contains heterogeneous matters, and among others sulphate of lime. He has found, moreover, in the alcoholic extract of rhubarb, a fatty matter containing a little odorous volatile oil, a yellow colouring principle susceptible of crystallization, and of subliming by heat without decomposition. It is to this principle that the name of *Rhabarbarine* ought to be given. Rhubarb contains besides a brown substance insoluble in water in its pure state, soluble in alcohol, and possessing some peculiar properties. When combined with rhabarbarine this brown matter then becomes soluble in water, and constitutes by this combination the *Caphopicrite* of several chemists, and even the *rhabarbarine* of Pfaff.

Various species of rhubarb, especially the *palmatum*, are cultivated in this country, and sometimes in very large quantities; so that there remains no doubt that the roots, the growth of this country, may be so prepared as to have the appearance, at least, of foreign rhubarb. The greatest difficulty seems to be to dry it properly, as it is commonly pasty under the pestle. British rhubarb, as it is called, is cultivated in considerable quantities in the neighbourhood of Edinburgh.

The leaf-stalks of rhubarb contain a pleasant acid juice, and are used in spring for making tarts, which are very like those of apples, but more acid; and Olivier tells us that the Persians have long been in the habit of using the *Rheum ribes* in the same manner, preserved or raw. Mr Henderson has examined the acid, which he considers as peculiar, and has named *Rheumic acid.*

Med. use.—Rhubarb is a mild carthartic, which operates without violence or irritation, and may be given with safety even to pregnant women and to children. In some people, however, it occasions severe griping. Besides its purgative quality, it is celebrated as an astringent, by which it increases the tone of the stomach and intestines, and proves useful in diarrhœa and disorders proceeding from laxity.

Rhubarb is exhibited, 1. In substance, in the form of powder. It operates more powerfully as a purgative in this form than in any other. The dose for an adult is about a scruple or upwards. On account of its great bulk, it is sometimes unpleasant to take a sufficient dose; its laxative effects are therefore often increased by the addition of neutral salts, or other more active purgatives. In smaller doses it often proves an excellent stomachic.

2. In infusion. Rhubarb yields more of its purgative property to water than to alcohol. The infusion is, however, considerably weaker than the powder, and requires double the dose to produce the same effect. It is well adapted for children, but must be always fresh prepared.

3. In tincture. On account of the stimulating nature of the menstruum, this preparation frequently cannot be exhibited in doses large enough to operate as a purgative. Its principal use is as a tonic and stomachic.

The purgative property of rhubarb is destroyed by roasting, boiling, and in forming the extract, but its astringency resists these processes.

Off. Prep.—Infusum rhei, *L. D.* Tinctura rhei, *L. E.* Tinct. rhei comp. *L. D.* Tinct. rhei cum aloe, *E.* Tinct. rhei cum gentiana, *E.* Vinum rhei palmati, *E.* Extractum rhei, *D.* Pilulæ rhei comp. *E.*

RHODODENDRON CHRYSANTHUM. *Ed.*

Willd. *g.* 867, *sp.* 7; Spr. *g.* 1548, *sp.* 8. *Decandria Monogynia.*—Nat. ord. *Bicornes*, Linn., *Erinaceæ*, Juss.

Yellow-flowered rhododendron.

Off.—The leaves.

FOLIA. *Ed.*

THIS small shrub grows in the coldest situations, and highest parts of the snow-covered mountains in East Siberia, and especially in Dauria. The leaves are oblong, rigid, reflected at the edges, rough on the upper surface, smooth, and paler on the lower. Recent, they have a smell something like rhubarb. When dried, they have no smell, but a rough, astringent, and bitterish taste. Stolze got from 4 oz. of dried leaves, 4 dr. 27 gr. of oxidized extractive; 1 oz. 4 dr. 2 gr. of soluble extractive, a modification of tannin; 2 dr. 5 gr. of green wax-resin; 7 dr. 10 gr. of extractive obtained by potash; 6 dr. of fibre, and the loss was 16 gr. They also contain a stimulant narcotic principle; for they increase the heat of the body, excite thirst, and produce diaphoresis, or an increased discharge of the other secretions or excretions, and, in a large dose, inebriation and delirium.

Med. use.—In decoction, the leaves are used in Siberia in rheumatism and gout. About two drachms of the dried leaves are infused in an earthen pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night, and the infusion is taken in the morning. It is said to produce a sensation of pricking or creeping in the pained parts; and in a few hours the pain and disagreeable symptoms are relieved. Two or three doses generally complete the cure. Liquids are not allowed during its operation, as they are apt to induce vomiting. It is likewise prescribed in paralysis, after the cerebral affection has been removed, and as is the case with some other narcotic stimuli, amendment, if it take place, is commonly preceded by uneasy sensations and twitchings of the palsied limbs.

RHUS TOXICODENRON. *Ed. Lond. Dub.*

Willd. *g.* 566, *sp.* 17; Spr. *g.* 1108, *sp.* 31; *Pentandria Trigynia.*—Nat. ord. *Dumosæ,* Linn., *Terebinthaceæ,* Juss.

Poison oak *.

Off.—The leaves.

FOLIA. *Ed. Lond. Dub.*

THIS is a deciduous shrub, of moderate growth, a native of North America. The leaves are alternate, and stand upon very long leaf-stalks. Each leaf consists of three leafits. Its juice is milky when it first exudes, but becomes jet black by exposure to the air. The black varnish of China is from another species of Rhus. The milky juice is inert upon some individuals, but very hurtful to others, causing a vesicular eruption of the part touched, and narcotic symptoms. It would seem that some persons are affected even by the emanations from the shrub.

Med. use.—The toxicodendron was first tried as a medicine by Dr Alderson of Hull, in imitation of the experiments of M. Fresnoi with the Rhus radicans, which is now considered only as a variety of the toxicodendron. He gave it in four cases of paralysis, in doses of half a grain, or a grain three times a-day, and all his patients recovered, to a certain degree, the use of their limbs. The first symptom of amendment was always an unpleasant feeling of pricking or twitching in the paralytic limbs. I have given it in larger doses, without experiencing the same success. It was not, however, inactive. In general it operated as a gentle laxative, notwithstanding the torpid state of the bowels of such patients. In one case the patient discontinued its use on account of the disagreeable pricking it occasioned; which, according to our present knowledge of the operation of narcotic stimuli, was a proof of its energy, and should have led me to persevere in its administration.

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* *Syn.* Sumac veneneux, (*Fr.*) Giftige Sumach, (*Ger.*) Summaco venenoso, (*It.*)

RICINUS COMMUNIS. *Ed. Lond. Dub.*

Willd. *g.* 1720, *sp.* 2; Spr. *g.* 3138, *sp.* 1. *Monœcia Monadelphia.*—Nat. ord. *Tricoccæ*, Linn., *Euphorbiaceæ*, Juss.

Palma Christi [*].

Off.—The seeds [†], and the fixed oil obtained from them, Castor oil [‡].

a) SEMINA RICINI COMMUNIS. *Ed.* SEMINA RICINI. *Lond.*

b) OLEUM FIXUM RICINI COMMUNIS. *Ed.* OLEUM RICINI, e seminibus expressum. *Lond. Dub.*

THIS beautiful plant grows in both Indies, Africa, Greece, the Levant, and the south of Europe. In tropical climates it survives several years. Richard saw, near Nice, a small wood consisting entirely of arborescent Palma Christi, but in Europe it is in general annual. There is but one species of this plant. Dr F. Hamilton found, however, four varieties very commonly cultivated in India. Two of them (*R. communis* and *R. lividus*, Willd.) are almost always cultivated for seed, and they are, therefore, sown close, so as to stint their growth, and thus bring them early to flower; and when they have ripened their seed, they are destroyed by the plough, a new sowing being more productive than if they were allowed to grow for several years. The other two varities (*R. viridis* and *R. Africanus*, Willd.) are chiefly cultivated for their leaves, on which a large kind of silk-worm is reared for spinning a coarse silk. On this account they are usually planted in hedges round the huts of those who rear the worms, and, being allowed to stand for years, acquire a considerable size.

The capsule is globular, with three salient sides, glaucous, and beset with flexible prickles. The seeds are oval, about the size of small coffee-beans, covered with a thin, shining, brittle coat (*testa*,) marbled with grey and blackish-grey, and with a thin, white, tasteless pellicle (*tegmen*,) and consist of two white oily cotyledons. The testæ weigh about 23.82 parts, the kernels 60.09, and there is 7.09 loss by moisture. According to Geyer's analysis, these 23.82 parts contain, brown resin, almost insipid, with a little bitter principle, 1.91; gum, 1.91; woody fibre, 20. The 69.09 parts of grain contain, greasy oil, 46.19; gum, 2.4; starch and woody fibre, 20; albumen, 0.5; water, 7.09. But Pfaff got no starch. What was supposed to be starch was in fact albumen, according to the analogy of other emulsive seeds.

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[*] *Syn.* Κικι, Κροτων, (*Dios.*) Palma Christi, (*Off.*) Palme de Christe, (*Fr.*) Grüner Wunderbaum, (*Ger.*) Ricino, Fagivulo d'India, (*It.*) Eranda, (*Sans.*) Haralu, (*Canarese.*) Citavanacu, (*Malay.*) Arend, (*Hind.*) Kherwa, (*Arab.*) Beedinjeer, (*Pers.*) Bherenda, (*Beng.*) Jarak, (*Sumatra.*) Fima, Too-goma, (*Jap.*) Cay-du-gu-deau, (*Cochin. Chin.*)

[†] *Syn.* Semina cataputiæ majoris, (*Off.*) Purgier-körner, (*Ger.*)

[‡] *Syn.* Oleum ricini, Oleum castoris, Oleum palmæ liquidum, Oleum de Kerva; Ol. Ficus infernalis, (*Off.*) Κινικον ἑλαιον, (*Graec.*) Huile de Castor, (*Fr.*) Ricinus öl; Castor öl, (*Ger.*) Olio di Ricino, (*It.*) Sittamoonakayunnay; Cottay unnay, (*Tam.*) Endooroo tail, (*Cyng.*) Oobali erundyka tail, (*Duk.*) Sitt-amindialoo noona, (*Tel.*) Eranda tailam, (*Sans.*) Duhn ul kherooa, (*Arab.*) Rowgen Bedangeer, (*Pers.*) Miniak jarak, (*Bali.*)

The kernels yield castor oil by expression, or by decoction with water. The former method is practised in Europe, and the latter in both Indies.

The process by expression is reckoned the best. It consists in freeing the seeds of the *Ricinus* of their husk *(testa,)* by striking them with a wooden mallet, inclosing the kernels in a strong cloth, and submitting them to the press. The oil thus obtained, after being filtered through grey paper, is very clear, colourless, has little smell, and a sweet taste. By being deprived of their husks the seeds lose a quarter of their weight; and when they have been cleaned they yield half of their weight of oil. Oil thus obtained alone is entitled to the appellation of cold drawn oil, although it is given to that imported from the East Indies.

Dr Wright has given an account of the method of extracting the oil from the seeds by decoction, as practised in Jamaica. Castor oil thus made, he tells us, is clear and well-flavoured, and if put into proper bottles will keep sweet for years; whereas the expressed oil turns rancid, because the mucilaginous and acrid parts of the nut are squeezed out with the oil. Dr Wright, therefore, prefers well prepared oil by decoction.

Our market is, however, chiefly supplied from the East Indies; and it is there also obtained by decoction, after having been repeatedly macerated in cold water, and subsequently dried. Dr Ainslie has detailed the process followed in the southern provinces of India. Take five seers of castor oil nuts, and soak them for a night in cold water; next morning strain the water off and throw it away, and put the nuts into a second quantity of fresh water, and boil them in it for two hours: after which strain the water off, and throw it away, as in the first instance. Then dry the nuts in the sun for three days; at the end of which time bruise them well in a mortar. Add to the nuts thus bruised, ten measures of water, and set them on the fire to boil; taking care to keep continually stirring the contents of the pot, until all the oil appears at the top, when it is to be carefully strained off, and after being allowed to cool, put into a bottle for use. In place of common water, cocoa nut water may be used, which is supposed to make the oil of a paler and finer colour. A coarser oil is prepared from the seeds of the large seeded variety, which has a more disagreeable odour, and considerable empyreuma, from the seeds being roasted previous to the expression of the oil. It is used for burning.

The process followed in the West Indies differs from that of the East, only in omitting the previous soaking and boiling in water before the seeds are bruised, which is perhaps the reason why the West India oil is more coloured.

Castor oil is sometimes extremely acrid. It has been a question of great interest among the French and German pharmaceutists to determine the cause of this occasional acrimony of castor oil, some ascribing it to the embryo, others to the shell or husk, and others to the employment of heat in its preparation. The first is the ancient opinion, and is maintained of other seeds of the same natural family. Thus Jussieu mentions it of the seeds of the *Hura crepitans;* and I have been told that its embryo swallowed alone purges drastically, while the seeds from which the embryo has been removed may be eaten as freely as almonds. Boutron-Charlard and Henry found that the *episperm* of the castor oil seeds possessed no acrimony, that the *embryo* alone yielded a mild oil, with an agreeable taste resembling green coffee, while the oil obtained from the *perisperm* or *albumen* alone becomes acrid, if too much heat be used in extracting it.

M. Guibourt has examined the point with great attention, and has come to the following conclusions. The shell of the castor oil nut does not contain any acrid principle, and can only render the oil coloured without imparting to it any bad quality. The taste of the embryo is only a little more acrid than that of the perisperm, and it cannot be said that it is the only or principal seat of its acrimony. The perisperm contains both the oily and the acrid principle. This acrid principle is volatile; water in the state of ebullition expels it from the oil, and by boiling it is possible to obtain an oil perfectly bland and little coloured. Too great a degree of heat, or heat too long continued, alters the nature of the oily principle itself, which acquires thereby a more or less deep colour, and an acrimony which should be considered to render it unfit for use.

Genuine castor oil is thick and viscid, of a whitish colour, insipid or sweetish to the taste, and without smell, and has the peculiarity of being soluble in alcohol in all proportions. Castor oil does not congeal at many degrees below the freezing point of water. It thickens in the air without losing its transparency. Although castor oil is very susceptible of rancidity, it is remarkable that, mixed with lard, it forms a composition which keeps very well. The proportions of this mixture which have succeeded were 120 parts of lard, with 32 of castor oil. Castor oil saponifies very easily. This soap may be obtained by mixing five parts of oil with two of soda ley at 36°. Castor oil soap is soluble in cold water, and has been useful against some slight herpetic (scaly cutaneous) affections. Solutions of this kind keep a very long time without undergoing alteration. The memoirs of MM. Bussy and Lecanu on the distillation of oily substances are extremely interesting. Castor oil yielded peculiar acids, which they have named ricinic, oleo-ricinic, and stearo-ricinic.

Med. use.—As a medicine, castor oil is a gentle and useful purgative: it in general produces its effects without griping, and may be given with safety where acrid purgatives are improper. Its use as a purge is so general that it is almost universally understood. To many people it is disgusting, not from the smell, for it has none, nor from the taste, for unless when rancid this is very slight,—but from a natural disgust which many people have to oil, on account of its greasiness and clamminess in the mouth, and perhaps from having been before sickened by it. Others, again, prefer castor oil to all other purgatives, as operating with them kindly without griping, causing full fæculent evacuation, and lubricating the intestines.

Castor oil is especially used, in obstinate constipation, from hardened excrement, acrid caustic substances, arsenic, and salts of lead; in inflammations and spasms; in child-bed fever, ileus, incarcerated hernia, hæmorrhoids, colic, &c.; in diarrhœa and dysentery, in order to reduce the inflammatory irritability of the intestines, and to mitigate gripes and tenesmus; in diseases of the urinary organs arising from chemical or mechanical stimuli; ischuria; against tetanus and trismus, and all general convulsions; against worms of all kinds, lumbrici, ascarides, and even tænia, in large doses, after, the fern powder has been administered. Half an ounce or an ounce commonly answers with an adult, and a drachm or two with an infant.

The aversion to swallowing oil is generally considerable. Different modes of overcoming this have been proposed.

Some prefer taking it swimming on a glass of water, or peppermint water; others, mixed with coffee, in the form of an emulsion, with mucilage, or with the addition of a little spirits. To modify its action, it is sometimes rendered more energetic, by the addition of croton oil, or oil of turpentine; and more soothing in cases of spasms and diarrhœa, by tincture of opium. Castor oil is also very efficacious in the form of clyster. Two ounces or more, with the requisite quantity of any emollient decoction, or with the addition of any of the purging salts, seldom fails to give relief in obstinate constipation.

It has even been injected into the bladder, in cases of calculus, to diminish the mechanical irritation.

ROCELLA TINCTORIA. Acharius. *Dub.*

Orchill *.

Off.—Litmus, turnsole.

LITMUS. *Dub.*

THIS lichen, the *Parmelia Rocella* of Sprengel, *g.* 3378, *sp.* 2, is found in Guernsey and Portland island, but it is from the Canary islands that it is chiefly obtained. It is not sold in the state of the plant merely dried, but as manufactured by the Dutch into a paste, called *Litmus, Orseille en pate.* It is in square masses, about an inch in length, and half an inch in breadth and thickness, hard and brittle, having the appearance of a violet coloured earth, with white spots. It has a violet smell, probably from the addition of orris root powder; and when tasted, speedily tinges the saliva, and gives a sense of heat in the mouth. This paste is prepared by making the lichen undergo a kind of fermentation in vats with urine and lime-water, forming the whole into a pulp, and then dividing it into squares to dry.

I must confess my ignorance of the grounds upon which the Dublin College have introduced it into their *Materia Medica.* The translator of the Pharmacopœia merely says, "It has been used medicinally with an intention of allaying the tickling attendant on phthisis, and in hysterical coughs."

Litmus is chiefly used as a dye-stuff, and by chemists as a very valuable test of the presence of uncombined acids, which change its blue colour to red. The directions in the Prussian Pharmacopœia for preparing this test, are to infuse it in powder in four times its weight of water for twenty-four hours, with occasional agitation, and to spread the solution upon sheets of very white paper, which are to be dried and kept in very close vessels, and in the dark.

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* *Syn.* Lichen rocelle, Orseille, (*Fr.*) Strauchartige Färberflechte, (*Ger.*) Oricello, (*It.*)

ROSA.

Willd. *g.* 997; Spr. *g.* 1874; Smith, *g.* 232. *Icosandria Polygynia.*—Nat. ord. *Senticosæ*, Linn., *Rosaceæ*, sect. *Roseæ*, Juss.

Sp. 16. Spr.; *sp.* 51. Willd. ROSA GALLICA. *Ed. Lond. Dub.*

Red rose [*].

Off.—The petals.

PETALA. *Ed. Lond. Dub.*

THIS has not the fragrance of the succeeding species; but the beautiful colour of its petals, and their pleasant astringency, have rendered them officinal. It must, however, be remarked, that their odour is increased by drying, while that of the damask rose is almost destroyed. They are kept dried for making gargles.

Off. Prep.—Mel rosæ, *D. L.* Conserva rosæ, *D. L. E.* Infusum rosæ, *L. E. D.* Syrupus rosæ gallicæ, *E.*

Sp. 15. Willd.; *sp.* 60. Spr. ROSA CENTIFOLIA. *Ed. Lond. Dub.*

Dutch hundred leaved rose, Damask rose [†].

Off.—The petals.

PETALA. *Ed. Lond. Dub.*

M. CHEREAU, in his examination of the officinal roses, has some doubts with regard to that designated under the name of *Rosa pallida* in the older British Pharmacopœias, and is inclined to consider it as a variety of the *Rosa gallica*; but this is not the case. In the Edinburgh Pharmacopœia 1783, the *Rosa damascena* of Parkinson is specified as the scientific synonym of the officinal *Rosa pallida*, and in the subsequent edition *Rosa pallida* is given as the vulgar synonym of *Rosa damascena*, which, although now considered as a distinct species, was formerly held to be only a variety of the *Rosa centifolia.*

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[*] *Syn.* Βανιουλ, (*Gr. Hod.*) Gul surkh, (*Pers.*)

[†] *Syn.* Ροδον, (*Diosc.*) Rose à cent feuilles, (*Fr.*) Blasse Rose, (*Ger.*) Rosa pallida, (*It.*) Tarani, (*Sans.*) Gul, (*Pers.*) Goolabu-poo, (*Tam.*) Goolabka phool, (*Duk.*) Wurd, Maulward, (*Arab.*) Hoa-houng-tau, (*Coch. Chin.*) Mei-kwe-hwa, (*Chin.*) Mawar, (*Mal.*) Gool-ao, (*Hind. Beng.*)

The process for distilling the essence, butter, attar, otter or utter of roses, has been described by M. Langles, and by Col. Polier. The latter author informs us that in Hindostan, at Lucknow, not nearly the same quantity of oil can be obtained that is reported by Hoffmann and Homberg. To procure something less than three drachms from a hundred pounds of rose leaves without the calyxes, the season must be very favourable and the operation carefully performed. He got in 1787 only about eight ounces from a field of eleven English acres. The colour of the attar also is no criterion of its goodness, quality, or country. Col. Polier had attar of a fine emerald green, of a bright yellow, and of a reddish hue, in the same year, from the same ground, and by the same process, from roses collected on different days. In Hindostan it is usual to add to the roses when put into the still a quantity of sandal-wood raspings. The sandal contains much essential oil, which comes over freely, and, mixing with the rose water and essence, becomes strongly impregnated with their perfume. The imposition, however, cannot be concealed, as the essential oil of sandal does not congeal in common cold, and its smell cannot be kept under. In Cashmere they seldom use sandal wood to adulterate the attar, but Col. Polier has been informed that to increase the quantity they distil with the roses a sweet scented grass, which does not communicate any unpleasant odour, and gives the attar a high clear green colour. This essence also does not congeal in a slight cold as that of roses.

Off. Prep.—Aqua rosæ, *D. L. E.* Syrupus rosæ, *D. L.* Syrupus rosæ centifoliæ, *E.*

Sp. 31. Willd.; *sp.* 77. Spr.; *sp.* 6. Smith. ROSA CANINA. *Ed. Lond. Dub.*

Common dog-rose, wild briar or hep-tree *.

Off.—The fruit called Heps.

FRUCTUS. *Ed. Dub.* PULPA; baccarum pulpa expressa. *Lond.*

THIS shrub is found in hedges throughout Britain, and flowers in June. The pulp of the fruit, besides saccharine matter, contains citric acid, which gives it an acidulous taste.

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* *Syn.* Αγϱιο τϱιανταφυλιὰ, (*Gr. Hod.*) Cynorrhodon, (*Off.*) Rosier sauvage, (*Fr.*) Hundrose, (*Ger.*) Rosa canina, (*It.*) Julnisrin, Nesrin, (*Arab.*) Sowtee; Wurd chinie, (*Hindost.*) Foosen, (*Japan.*)

The seeds, and stiff hairs with which they are surrounded, must be carefully removed from the pulp before it can be used.

Off. Prep.—Conserva rosæ caninæ, *L.*

Rosmarinus officinalis. *Ed. Lond. Dub.*

Willd. *g.* 62, *sp.* 1; Spr. *g.* 95, *sp.* 1. *Diandria Monogynia.*—Nat. ord. *Verticillatæ*, Linn., *Labiatæ*, Juss.

Rosemary [*].

Off.—The tops.

Cacumina. *Ed. Lond. Dub.*

Rosemary is a perennial shrub, indigenous in the south of Europe, and cultivated in our gardens. It flowers in June and July, and the flowering tops are collected. They have a strong, balsamic, refreshing smell, and a hot bitterish, camphoraceous, and slightly terebinthaceous taste. When dried they have little taste of camphor, and none of turpentine. A watery infusion is dark brown, bitterish, and scarcely aromatic. The tincture is yellowish-green, has the smell of rosemary, and a balsamic pretty bitter taste. They yield a camphoraceous oil by distillation, about a scruple from the pound.

Med. use.—They are chiefly used externally as a discutient and stimulant remedy, conjoined with other aromatics, in epithems and fomentations, and for the distillation of a spirit and volatile oil.

Off. Prep.—Oleum rosmarini, *D. L. E.* Spiritus rosmarini, *D. L. E.*

Rubia tinctorum. *Ed. Lond. Dub.*

Willd. *g.* 187, *sp.* 1; Spr. *g.* 369, *sp.* 1. *Tetrandria Monogynia.*—Nat. ord. *Stellatæ*, Linn., *Rubiaceæ*, Juss.

Madder [†].

Off.—The root.

Radix. *Ed. Lond. Dub.*

Madder is perennial, and is cultivated in large quantities in Zealand, from whence the dyers are principally supplied with it. It has been said to grow wild in the south of England, but the *Rubia peregrina* was mistaken for it.

The roots consist of articulated fibres, about the thickness of a quill, which are red throughout, have a weak smell, and a bitterish astringent taste. For the use of the dyers, they are first peeled and dried, then bruised and packed in barrels. Dried madder root has been analyzed by Buchholz and by John, and its colouring principles have engaged the attention of many chemists. The most remarkable of these has been called by Robiquet and Colin *Alizarine.* It has the appearance of Spanish snuff. By a continued gentle heat it forms a yellowish vapour, smelling like heated fat, and is condensed in the form of small red crystals, like that of the natural chromate of lead. These have neither taste nor smell, sublime easily, are soluble in cold water, but give to boiling water a rose-red colour. Alcohol makes a red, and ether an orange solution. They are readily soluble in alkaline leys, forming blue or violet, and when diluted a reddish violet, solution.

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[*] *Syn.* Anthos, (*Off.*) Λιϐανωτις, (*Dios.*) Δενδϱολιϐανον, (*Gr. Hod.*) Romarin, Encensier, (*Fr.*) Gemeiner Rosmarin, (*Ger.*) Rosmarino, Ramerino, (*It.*) Tay-duong choi, (*Cochin Chin.*) Hasalban achsir, (*Arab.*)

[†] *Syn.* Garance, (*Fr.*) Krapp, (*Ger.*) Robbia, (*It.*)

Med. use.—Madder possesses the remarkable property of tinging the urine, milk, and bones of animals which are fed with it, of a red colour. It is said to be useful in carious bones, and in the atrophy of children, and some believe in its reputed powers as an emmenagogue.

It is given in substance in doses of half a drachm, several times a-day, or in decoction.

RUMEX.

Willd. *g.* 699; Spr. *g.* 1385; Smith, *g.* 184. *Hexandria Trigynia.*—Nat. ord. *Oleraceæ,* Linn., *Polygoneæ,* Juss.

Sp. 18. Willd.; *sp.* 8. Smith. RUMEX AQUATICUS. *Dub.*

Great water-dock *.

Off.—The root.

RADIX. *Dub.*

THIS, the *Rumex hydrolapathum* of Hudson and Sprengel, is an indigenous herb with a perennial root, growing in ditches and by the sides of rivers. It attains the height of five feet, and flowers in July and August. The root is large, and strongly astringent.

Med. use.—It evidently is the *Herba Britannica* of the ancients, so much celebrated in old times for the cure of scurvy and cutaneous diseases. Even syphilis has been said to yield to an infusion of water-dock in wine and vinegar.

Sp. 31. Willd.; *sp.* 44. Spr.; *sp.* 10. Smith. RUMEX ACETOSA. *Ed. Lond. Dub.*

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* *Syn.* Wasserampfer, (*Ger.*) Pareile des marais, Oseille à la parasseuse, (*Fr.*)

Common sorrel *.

Off.—The leaves.

FOLIA. *Ed. Dub.* ACETOSÆ FOLIA. *Lond.*

SORREL is a perennial plant, which grows wild in fields and meadows throughout Britain, and flowers in June. The leaves have a pleasant acid taste, without any smell or particular flavour. They contain tartaric acid, binoxalate of potass, mucilage and starch.

Med. use.—They are refrigerant and diuretic. The leaves are used in diet, boiled in the manner of spinage. The expressed juice, with water, forms an acidulous drink, to quench thirst and allay heat in fevers; and boiled in whey, they give it an agreeable acidity.

RUTA GRAVEOLENS. *Ed. Lond. Dub.*

Willd. *g.* 927, *sp.* 1; Spr. *g.* 1500, *sp.* 1. *Decandria Monogynia.*—Nat. ord. *Multisiliquæ, Linn*, *Rutaceæ*, Juss.

Rue †.

Off.—The herb.

HERBA. *Ed.* FOLIA. *Lond. Dub.*

THIS is a small shrubby plant, a native of the south of Europe, and cultivated in our gardens.

Rue has a strong ungrateful smell, and a bitterish penetrating taste: the leaves, when in full vigour, are extremely acrid, insomuch as to inflame and blister the skin, if much handled. Its acrimony is much diminished by drying. Neumann got from 960 grains of the dried leaves 330 alcoholic extract, and afterwards 290 watery; and inversely, 540 watery and 40 alcoholic. Both primary extracts are bitter and acrid. It has been more recently analyzed by Mähl, who got in garden rue, a fluid greenish-yellow volatile oil of a less unpleasant smell than the herb, and a somewhat acrid taste, green soft wax, extractive, albumen, malic acid, a substance precipitated by tincture of nutgalls, black-grey gum, peculiar fæcula and fibre. The oil is obtained in the greatest quantity by distilling the plant with the seed half-ripe.

Med. use.—With regard to its medical virtues, like other remedies of which the active constituent is an essential oil, it is heating and stimulating, and hence it is sometimes serviceable in spasmodic affections and cases of obstructed secretions. The most powerful extract is obtained by using wine as a menstruum. An infusion in vinegar is also used.

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* *Syn.* Oseille, (*Fr.*) Sauerampfer, (*Ger.*) Acetosa, (*It.*) Sookan Reeray, (*Tam.*) Chukka, (*Duk.*) Kattoo tumpala, (*Cyn.*) Chukrika, Satavedhi, (*Sans.*) Chooka palung, (*Ben.*) Chewka, (*Hindooie,*) Tursheh, (*Pers.*) Soori, (*Cyn.*)

† *Syn.* Rue sauvage, (*Fr.*) Raute, (*Ger.*) Ruta, (*It.*) Arooda, (*Tam. Arab. Pers. Duk. Cyng.*) Suddab, (*Mah.*) Saturee, (*Hind.*) Sadsa, (*Mal.*) Suddapoo akoo, (*Tel.*) Brahmi, Somalata, (*Sans.*) Inghoo, (*Jav.*) Sendib, (*Arab.*) Mats-kase-so, (*Japan.*)

Off. Prep.—Oleum rutæ, *D.* Extractum rutæ, *D. E.* Conserva rutæ, *D.*

SACCHARUM OFFICINARUM. *Ed. Lond. Dub.*

Willd. *g.* 122, *sp.* 4; Spr. *g.* 296, *sp.* 1. *Triandria Digynia.* —Nat. ord. *Gramina,* Linn. Juss.

Sugar-cane *.

Off.—a) Raw or brown sugar.

SACCHARUM. Præparatum e succo expresso. *Lond.* SACCHARUM NON PURIFICATUM. *Ed.* SUCCUS CONCRETUS NON PURIFICATUS. *Dub.*

b) Double refined sugar.

SACCHARUM PURIFICATUM. *Lond.* SUCCUS CONCRETUS PURIFICATUS. *Dub.* SACCHARUM PURISSIMUM. *Ed.*

c) Molasses.

SYRUPUS EMPYREUMATICUS. *Ed.* Anglice **Molaſſes.** *Dub.*

THE sugar-cane is said to be indigenous on the banks of the Euphrates, and in the East Indies, but it is now extensively cultivated in both Indies and in Brazil. It is one of the largest of the grasses, growing to the height of 8 to 12 feet, and acquiring a diameter of one or two inches. The stalk is filled with a loose cellular juicy pith, and covered with a hard, smooth, shining epidermis of different colours, in different varieties. Proust analyzed the fresh juice of the sugar-cane, and got an aroma like that of rum, extractive, sugar, mucous or uncrystallizable sugar, gum, green fæcula, malic acid and gypsum.

Sugar is obtained by boiling down the expressed juice, with the addition of a certain proportion of lime or potashes, until the greater part is disposed to concrete into brownish or yellowish crystalline grains. The lime or potass is added to saturate the malic acid, whose presence impedes the crystallization. The *molasses* is that portion of the inspissated juice which does not crystallize. The crystallized portion, *Moscavado* or *raw sugar*, is sometimes partially purified, by covering its surface in proper vessels with a layer of moist clay, the water from which gradually filters through it, dissolving out some molasses. Sugar thus treated is called *Clayed sugar*, and has lost its crystalline appearance. But the greater portion of the colonial sugar is sent to Europe to be refined. This used to be performed by dissolving it in water, boiling the solution with lime water, clarifying it with serum, or white of eggs, and straining it through woollen bags. The solution, after due evaporation, was permitted to cool to a certain degree, and then poured into conical forms of unglazed earthen-ware, where it concreted into a mass of irregular crystals. The coloured syrup or molasses which had not crystallized run off through a hole in the apex of the cone. The upper or broad end of the cone was then covered with moist clay, the water of which gradually penetrated into the sugar, and displaced a quantity of impure syrup, which would otherwise have been retained in it, and have discoloured it. It was then carefully dried, and got the name of *Loaf* or *Lump sugar*. When the solution and other steps of the process were repeated, the sugar was said to be *Double refined.*

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* *Syn.* Canne à sucre, (*Fr.*) Zuckerrohr, (*Ger.*) Cannamele, (*It.*) Quasab, Ganitsch, Buz farfi, (*Arab.*)

Sugar is now generally refined by what is called the patent process, which consists in first washing the raw sugar with a very little water; dissolving it in water heated by means of steam, fining it with alum saturated by quicklime, filtering it rapidly in a particular apparatus; boiling it down *in vacuo;* setting it to granulate at 150°; and, lastly, pouring it into moulds, and washing out the liquid syrup by saturated syrup as formerly. By this process there is much less empyreumatic syrup formed, and even a considerable quantity of sugar can be obtained from the molasses imported from the Indies.

Sugar is sometimes made to assume a more regular form of crystallization, by carrying the evaporation only a certain length, and then permitting the syrup to cool slowly; but the addition of alcohol is necessary to make it crystallize, otherwise it forms *Barley sugar*. In crystals it is called *Brown* or *White sugar-candy*, according to the degree of its purity.

Raw sugar varies very much in quality. It should be dry, crystallized in large sparkling hard grains, of a whitish or clear yellow colour, like bruised sugar-candy, without smell, and of a strong sweet taste, without any peculiar flavour.

Molasses or treacle is thick, viscid, of a dark brown, almost black colour, and has a peculiar smell, and a sweet, somewhat acid and empyreumatic taste. It is deteriorated by dilution, especially with sea water, by accident or design.

Refined sugar should have a brilliant white colour, and a close compact texture. It should be very hard and brittle, and break with sharp, semi-transparent, splintery fragments; and as it has been lately adulterated with sea salt, it should have a pure sweet taste, in no degree salt, and should dissolve entirely in spirits.

Pure sugar forms oblique, four-sided, or irregular six-sided prisms terminated by two inclined surfaces, and often truncated on the acute angles; sp. gr. 1.6065, white, hard, of a sweet taste and thermoelectric; phosphorescent by friction or fracture. When heated gently *in vacuo*, it loses only 0.001 of its weight. It melts readily, but even by the most cautious heating it gradually is converted into a transparent brown, brittle, uncrystallizable mass, becoming, when exposed, moist and tough like mucous sugar, and called *Caromel.* At a higher temperature it froths up, and emits a pungent aromatic smell, and a highly inflammable gas. It is readily inflammable, burns with a white flame, and leaves a voluminous coal. Sugar at 40° is soluble in its own weight of water, and is still less at 212°. It is soluble in about four parts of boiling alcohol, sp. gr. 0.830, but of absolute alcohol it requires eighty times its weight for solution. It combines with volatile oils, and renders them miscible with water. It unites with potass and lime. It is decomposed by the concentrated sulphuric and nitric acids.

Med. use.—Sugar, from being a luxury, has now become one of the necessaries of life. In Europe, it is used almost solely as a condiment. But it is also a very wholesome and powerful article of nourishment; for during crop time, the negroes in the West Indies, notwithstanding their increased labour, always grow fat. It is as food also that its internal employment is useful in some diseases, as in sea scurvy. The coarse and impure kinds are slightly purgative. Sugar has been lately recommended as the antidote of verdegris. Applied externally it acts as an escharotic on spongy and unhealthy granulations; and to abraded or inflamed surfaces it proves gently stimulant. In pharmacy it is principally employed to cover bad tastes, to give form to, and to preserve more active substances. In using it for the last purpose, we must always remember, that if the proportion of sugar employed be too small, it will promote, instead of retarding the fermentation of the articles it is intended to preserve. Treacle is applied to many domestic and economical purposes. It is well adapted for covering the taste of nauseous drugs; and in hospital practice may supersede the use of sugar in many instances.

Off. Prep. of molasses.—Syrupus cassiæ sennæ, *E.* Pilulæ calomelanos comp. *D.* Pil. colocynth. comp. *D.* Pil. galbani comp. *D.* Electuarium sennæ, *D.*

Off. Prep. of unrefined sugar.—Pilulæ ferri comp. *D.* Infusum sennæ cum tamarindis, *D.* Inf. sennæ comp. *E.*

Off. Prep. of refined sugar.—Syrupus aceti, *E.* S. althææ, *L. E. D.* S. aurantii, *L. E. D.* S. colchici autumnalis, *E.* S. limonis, *L. E. D.* S. caryophyllorum, *E.* S. croci, *L.* S. papaveris somniferi, *L. E. D.* S. mori, *L.* S. rhamni, *L. D.* S. rosæ centifoliæ, *L. E. D.* S. rosæ gallicæ, *E.* S. sarsaparillæ, *L. D.* S. scillæ, *E.* S. sennæ, *L.* S. simplex, *L. E. D.* S. tolutanus, *L. E.* S. violæ, *D. E.* S. zingiberis, *L. E. D.* Inf. menthæ comp. *D.* Inf. rosæ, *L. E. D.* Emulsio arabica, *D. E.* Em. amygdal. *E. D.* Em. camphoræ, *E. D.* Mistura cretæ, *L. D. E.* Mist. ferri comp. *L. D.* Confectio amygd. *L. D.* Conf. aromatica, *L. D.* Conf. aurantii, *D.* Conf. piperis nigri, *L. D.* Elect. sennæ comp. *E.* Trochisci carbon. calcis, *E.* Troch. carb. magnesiæ, *E.* Troch. glycyrrh. glabræ, *E.* Troch. gummosi, *E.* Troch. nitratis potassæ, *E.* Pil. ferri comp. *L.*

SAGAPENUM gummi-resina. *Dub. Ed.* Plantæ nondum descriptæ *Gummi-resina. Lond.*

Sagapenum *.

THE plant which furnishes this substance is not ascertained. It is conjectured by Willdenow to be the *Ferula Persica;* but M. Szowits has ascertained that this species yields assafœtida, and not sagapenum. Pinkerton says Sagapenum is furnished by the *F. communis.*

Sagapenum is a concrete juice, brought from Alexandria. It occurs in distinct tears, or agglutinated in masses of various sizes and forms. Those which are brown cakes, wrapped up in blue cloth, are of no value. They ought to consist chiefly of grains, whitish, shining, subdiaphanous, tenacious, at the same time capable of being cut into white shavings; when softened by the heat of the hand, very viscid, having a smell like gum-ammoniac, but not fetid, and an acrid durable taste like assafœtida. It is less soluble in alcohol than in water, is easily inflamed, and burns with a smoky flame. It is not fusible.

Neumann got from 480 grains, 306 alcoholic, and 108 watery extract; and inversely, 170 watery, and 241 alcoholic extract. The alcohol distilled from it was sensibly impregnated with its flavour, and along with the water a considerable portion of volatile oil arose. Brandes got volatile oil, 27.334; peculiar soft resin, 479.1; half resin, hard, insoluble in ether, 23.75; gum, with malate, sulphate, and phosphate of lime, 327.6; tragacanthine, 44.8; supermalate of lime, sulphate of lime, with a trace of resin, 4; phosphate of lime, with a trace of tragacanthine, 2.75; malate of lime, sulphate of lime, with a little gum, 4.5; water, 46; foreign impurities, 43 = 1012.834.

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* *Syn.* Gomme seraphique, Sagapen, (*Fr.* Serapin-gummi, Sagapen, (*Ger.*) Sagapeno, (*It.*)

Med. use.—In medical virtues it holds a kind of middle place between assafœtida and galbanum, and may be employed in the same manner, and under similar circumstances.

Off. Prep.—Pilulæ galbani comp. *L. D.* Conserva rutæ, *D. L.*

SALIX.

Willd. *g.* 1756; Smith, *g.* 409. *Diœcia Diandria ;* Spr. *Diandria Monogynia, g.* 129.—Nat. ord. *Amentaceæ,* Linn., *Salicineæ,* Juss.

Sp. 10. Willd.; *sp.* 14. Spr.; *sp.* 17. Smith. SALIX FRAGILIS. *Dub.*

Crack willow *.

CORTEX. *Dub.*

Sp. 33. Willd.; *sp.* 17. Spr.; *sp.* 45. Smith. SALIX ALBA. *Dub.*

Common white willow †.

CORTEX. *Dub.*

Sp. 101. Willd.; *sp.* 50. Spr.; *sp.* 40. Smith. SALIX CAPREA. *Lond. Dub.*

Great roundleaved sallow ‡.

Off.—The bark.

CORTEX. *Lond. Ed. Dub.*

THE bark of these, as well as of other indigenous species (as *S. pentandra, vitellina* and *Russeliana*) of willow, have been recommended as substitutes for cinchona.

Willows generally love a moist soil. The *S. caprea* is an exception. Their wood is soft, and they seldom are allowed to attain great size. The bark should be collected in spring, and from branches two or at most three years old.

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* *Syn.* Saule fragile, (*Fr.*) Knackweide, Bruchweide, (*Ger.*)

† *Syn.* ίτεα λευκη, (*Theoph.*) Saule, (*Fr.*) Gemeiner Weide, (*Ger.*)

‡ *Syn.* Saule marceau, (*Fr.*)

The bark of the *S. fragilis* is covered with a smooth, shining greenish-yellow epidermis, tough, fibrous, with a sweetish balsamic smell, a balsamic bitter taste, and afterwards strongly styptic. The bark of the *S. alba* has a brown epidermis, is thin, flexile, fibrous, and has a similar taste and smell. The bark of the *S. pentandra*, when young, is green and smooth, and when old ash grey and fissured.

Willow bark was analysed by Pelletier and Caventou, but they could find in it no alcaloid. They got tannine, an acid, a red-brown resin, a green balsamic resin, yellow colouring matter and gum; but Fontana and Buchner have believed that they have found a salifiable base, which they have called *Salicine.*

It is powdered with difficulty, and the powder is light and loose.

Med. use.—The white willow was first introduced into practice by Mr Stone; and strong evidence in favour of its use in debility, intermittents, and foul ulcers, has been published by Messrs James, White and Wilkinson. Willow bark is given in decoction. An ounce and a half of the dried bark should be first macerated six hours in two pounds of water, and then made to boil in it for ten or fifteen minutes. An ounce or two of this decoction may be given three or four times a-day, or oftener.

SALVIA OFFICINALIS. *Ed.*

Willd. *g.* 63, *sp.* 7; Spr. *g.* 94, *sp.* 109. *Diandria Monogynia.*—Nat. ord. *Verticillatæ*, Linn., *Labiatæ*, Juss.

Sage *.

Off.—The leaves.

FOLIA. *Ed.*

SAGE is a perennial plant, a native of the south of Europe, and cultivated in our gardens. There are several varieties of it, differing in size, or in the colour of the flower; but their properties are the same. The leaves are lanceolato-ovate, crenulate, petiolated, subvillous on both sides, rugose above, reticulated beneath, lacunose, thickish, of a hoary green colour; smell at first agreeable, strongly aromatic and camphoraceous; taste bitterish, aromatic, camphoraceous and somewhat astringent. They are gathered before inflorescence. The fresh plant was analyzed by Ilisch, but without any important result. The infusion is brown, and has a strong camphoraceous and bitter taste. It is rendered green by chalybeates. A pound of the dried plant yields about half a drachm of volatile oil, which, on evaporation, leaves about one-eighth of camphor.

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* *Syn.* Ελελισφακον, (*Diosc.*) Sauge, (*Fr.*) Gemeiner Salbey, (*Ger.*) Salvia, (*It.*) Sayselley, Simie carpoorum elley, (*Tam.*) Saoohal, (*Cyn.*) Valaitie capoor ka paat, (*Duk*) Shingjin, (*Chin.*) Salbiah, (*Pers.*) Safakass, (*Arab.*) Babinso, (*Jap.*)

Med. use.—In its effects, sage agrees with other aromatics. It is stimulant, carminative, and tonic. The best preparation for these purposes is an infusion of the dried leaves, drunk as tea. With the addition of a little lemon-juice, it proves an useful diluting drink in febrile disorders, being sufficiently agreeable to the palate.

SAMBUCUS NIGRA. *Lond. Ed. Dub.*

Willd. *g.* 569, *sp.* 3; Spr. *g.* 1104, *sp.* 2; Smith, *g.* 157, *sp.* 2. *Pentandria Trigynia.*—Nat. ord. *Dumosæ*, Linn., *Caprifoliaceæ*, Juss.

Common elder *.

Off.—*a)* The flowers.
FLORES. *Ed. Lond. Dub.*
b) The berries.
BACCÆ. *Ed. Dub.*
c) The inner bark.
CORTEX. *Ed. Dub.*

THIS tree is frequent in hedges; it flowers in June, and ripens its fruit in September. The flowers grow in cymes, and after cutting off the footstalks, are to be dried quickly, without turning them; during which operation they shrink very much, and acquire a pale sulphur colour. When recent, the petals are white, and have a peculiar, strong balsamic smell, which resembles that of frontignac wine, somewhat affecting the head, and a bitterish mucilaginous taste. Their infusion is reddish, rendered olive-green by chalybeates, and copiously precipitated by tincture of nutgalls. By distillation they yield a volatile oil, which crystallizes at common temperatures.

The berries are about the size of peas, round, depressed at the apex, on which are adpressed the teeth of the calyx; epidermis smooth, shining, violet-black, monolocular, filled with a reddish-black pulp, and containing three small seeds; smell, when recent, strong; taste sweetish-sour. The juice is coloured violet by alkalies, bright red by acids, and furnishes a blue precipitate with acetate of lead, while the fluid is rendered colourless. They contain principally malic acid, with a little citric, much sugar and a little jelly. The dried berries were formerly officinal under the name of *Grana actes.* The bark is ash coloured.

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* *Syn.* Sureau, (*Fr.*) Holunder-flieder-baum, (*Ger.*) Sambuco, (*It.*)

Med. use.—An infusion of the inner green bark of the trunk in wine, or the expressed juice of the berries in the dose of half an ounce or an ounce, is said to purge moderately, and in small doses to prove an efficacious deobstruent. The expressed juice of the berries, inspissated to the consistence of a rob, proves an useful aperient medicine, and, if continued for a sufficient length of time, is of considerable service in various chronical disorders. The young leaf-buds are strongly purgative, and act with so much violence as to be accounted unsafe. The flowers yield their agreeable aromatic flavour in distillation to water, and impart, by infusion, to vinous and spiritous liquors and oils.

Off. Prep. of the juice.—Succus spissatus sambuci, *D. E.*
——— *of the flowers.*—Unguent. sambuci, *D. E.*

SANTALUM RUBRUM. *Dub.* See PTEROCARPUS.

SAPO *.

a) Hard soap, composed of soda and olive oil.

SAPO: Sapo albus Hispanus, ex oleo Oleæ Europæ et soda confectus. *Ed.* SAPO DURUS. *Dub.* Sapo ex olivæ oleo et soda confectus (Hispanicus.) *Lond.*

b) Soft soap made of oil and potass.

SAPO MOLLIS. *Dub.* Sapo ex oleo et potassa confectus. *Lond. Ed.*

SOAPS are saline compounds resulting from the union of the salifiable bases with the oleic and margaric acids, which are formed from the oils and fats by the reaction upon them of the alkalies.

The true theory of saponification has been explained by Chevreul. We have already stated, that oils and fats consist of two substances, elaine and stearine, in various proportions. These principles, when they are subjected to the action of alkaline substances, are converted into acids, which are called *Oleic* and *Margaric*, and soaps are, in fact, a mixture of the oleate and margarate of the alkali employed. The characteristic properties of these acids are:

Margaric acid is solid, and of a pearl-white colour, insipid, weak smell like that of white wax, lighter than water, and does not redden tincture of turnsole until it be softened by heat; at 134 Fahr. it melts into a colourless very limpid liquid, which crystallizes on cooling into brilliant crystals of the purest white. It is partly volatilized, and partly decomposed by heat.

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* *Syn.* Savon de sonde huileux, (*Fr.*) Oel-sodaseife, (*Ger.*) Sapone olioso, (*It.*) Nat sowcarum, (*Tam.*) Saboon, (*Arab. Duk.*) Sujah, Saboon, (*Mall.*)

Oleic acid is a pale yellow fluid, with a rancid smell and taste; sp. gr. 0.898; reddens infusion of litmus; insoluble in water, and very soluble in alcohol; below 43 Fahr. it concretes into white acicular crystals.

One variety of each of the alkaline soaps is officinal; soft soap made with potass, hard soap with soda, and the volatile liniment is an ammoniacal soap: but for each kind of soap, certain oils are preferable.

Soft soap is a transparent brown gelatinous mass, with opaque white spots interspersed through it. When perfect it is neutral. From an excess of alkali it is deliquescent. When cloudy it denotes the presence of soda or lime. In this country soft soap is made with fish oil. It may be also made with linseed oil; and nut oil yields it of very good quality. The white spots are said to be owing to an admixture of tallow. Dr Ure found good Glasgow soft soap to consist of potash 9., oily matter 43.7, and water 47.3 = 100. In medicine it is only used as a detergent and cataplasm; but some apothecaries improperly substitute it for Castile soap in the preparation of anodyne balsam.

Hard soap is of many qualities, but they may be generally divided into white, mottled, and brown soap. In this country white soap is made with tallow; and brown soap with a mixture of tallow, rosin, and a little palm oil. Mottled soap is made of the same materials as white soap, but differently treated, so as to retain the alumino-ferrugineous soap, which is always formed, but separated in the manufacture of white soap. Mottled soap is always harder, and cannot contain above 16 *per cent.* of water, whereas the appearance of white soap is improved by an excess of water, which is never less than 33 *per cent.* Transparent soap may be made by dissolving white soap in boiling alcohol: On cooling it forms a clear jelly, which dries transparent like amber.

The officinal species of hard soap is composed of olive oil and soda. It is only prepared in the countries which produce the oil. For medicinal use we prefer the Spanish. It should be white and hard, dissolve entirely in water and in alcohol, forming with the former a milky, and with the latter a transparent solution: and the solutions should froth freely on agitation. It should not feel greasy or moist, or be covered with a saline efflorescence; and the solution should not have a rancid smell or taste. The mottling is an impurity. Some of the foreign Dispensatories are so very particular about the nature of the soap used in medicine, as to direct it to be prepared by the apothecary, by simply triturating, without the assistance of heat, Provence oil, with half its weight of a solution of soda, of the specific gravity of 1.375, until they unite. The French Pharmacopœia prescribes the fresh oil of sweet almonds for the preparation of medicinal soap, and directs it not to be employed in medicine till it be two months old.

Various kinds of soap have been analyzed by able chemists. The results are,

	Soda.	Oily matter.	Water.
Castile,	9	76.5	14.5
London imitation,	10.5	75.2	14.3
French cakes,	4.6	50.2	45.2
Marseilles,	6.	60.	34.
Glasgow best white,	6.4	60.	33.6
Berry's white,	8.	75.	17.
Glasgow brown,	6.5	70.	23.5

Soap is decomposed by all the acids, earths, and earthy and metalline salts. The acids combine with the alkali, and separate the oil. The earths form an insoluble earthy soap with the oil, and separate the alkali; while with the salts there is a mutual decomposition, their acid combines with the alkali, and earthy or metalline soaps are formed. The earthy soaps are insoluble in water. The metallic soaps are also insoluble in water; many of them are soluble in oil, and some of them in alcohol.

Med. use.—The detergent property of soap, or the power it possesses of rendering oily and resinous substances miscible with water, has given rise to the erroneous notion of its possessing detergent medical virtues. It has likewise been supposed to be a powerful menstruum for urinary calculi. A solution of soap in lime-water has been considered as one of the strongest solvents that can be taken with safety into the stomach; for the virtue of this composition has been thought considerably greater than the aggregate of the dissolving powers of the soap and lime-water when unmixed; but it is only a clumsy way of exhibiting a solution of soda; for the soap is decomposed, an insoluble soap of lime is formed, and the soda remains in solution. The internal use of soap should therefore be confined, in my opinion, to the giving form to other substances which are not decomposed by it, and to the decomposing metallic poisons when they have been taken into the stomach. For this last purpose, a tea-cupful of a solution of soap in four times its weight of water may be drunk every three or four minutes, until a sufficient quantity be taken.

Applied externally, soap is a very powerful detergent, and combines the stimulating properties of the alkali with the lubricity of the oil. In this way it often proves a powerful discutient, and a useful application to sprains and bruises.

Off. Prep. of hard soap.—Extractum colocynthidis comp. *L. D.* Pilulæ colocynth. comp. *D.* Pilulæ aloëticæ, *E.* Pil. aloës et assæfœt. *E.* Pil. subcarbon. sodæ, *E.* Pil. gambog. comp. *D. L. E.* Pil. saponis cum opio, *D. L.* Pil. suillæ comp. *D. L.* Ceratum saponis, *L.* Emplastrum saponis, *D. L. E.* Tinct. saponis comp. *E. L. D.* Tinct. saponis et opii, *E.*

SARSAPARILLA. *Lond. Dub.* See SMILAX.

SASSAFRAS. *Lond. Dub.* See LAURUS.

SCAMMONIUM. *Lond. Dub.* See CONVOLVULUS.

SCILLA MARITIMA. *Ed. Lond. Dub.*

Willd. *g.* 640, *sp.* 1; Spr. *g.* 1217, *sp.* 26. *Ornithogalum marit.*, Brot. *Hexandria Monogynia.*—Nat. ord. *Liliaceæ*, Linn. Juss.

Squill [*].

Off.—The root.

RADIX. *Ed. Lond.* BULBUS. *Dub.*

THE squill is a perennial bulbous-rooted plant, which grows wild on the sandy shores of Spaïn, Portugal, north of Africa, and the Levant.

The bulb varies in size from that of the fist to that of a child's head. It is pear shaped, with the apex upwards, and consists of white fleshy scales, attenuated at both edges, surrounded by some scales of a pinkish colour, which are arid, shining, and so thin; that the bulb, at first sight, seems to be tunicated. The recent root is very succulent. It has when cut the smell of radishes, very weak, and not at all alliaceous, and to my palate a mucilaginous taste, unpleasantly bitter and slightly acrid. When rubbed on the skin it causes a painful itching, and excites inflammation. The expressed juice is milky, passes very slowly through filtering paper, is remarkably bitter, soon acquires a reddish colour by keeping, and by boiling becomes reddish, and deposites crystals. The recent bulb has been analyzed by Athanasius, Vogel, Tilloy and Buchner. According to Vogel, by drying, 100 parts of the sliced bulb are reduced to 18. In this state it was found to contain mucus, 6; peculiar bitter extractive, (scillitine,) 35; tannine, 24; citrate of lime, sugar, and fibre, 80; loss, 5=100. Vogel could not find starch, which was enumerated amongst its principles by Athanasius. I have also found that it is not affected by tincture of iodine. The tannine, I am satisfied, has, by his mode of analysis, been greatly overrated by Vogel. In my experiments a solution of the persulphate or permuriate of iron did not affect a shred of the recent root, nor of the dried root moistened in water, and gave only a slight green tint to tincture of squill without precipitate. Buchner also found that the expressed juice, diluted so as to pass the filter, was only rendered slightly turbid by solution of isinglass; and although it acquired a dark green colour, passing into black, from persulphate of iron, no precipitate fell in 24 hours. Vogel could not procure the acrid principle separate. The distilled water had neither taste nor smell, and did not redden litmus paper. Vogel drank six ounces without being affected by it. The dried powder retains the acrimony, as made with water into a cataplasm it raised blisters. Buchner informs us, that of all the principles into which he analyzed squill, the acrimony was found to exist only with some phosphate of lime, which fell as a sediment from the diluted juice, although it lost the acrimony by digestion with alcohol, which, however, took up almost nothing, and acquired no acrimony. The bitter extractive, soluble in alcohol and water, was considered by Vogel to be the active principle, and had been called *Scillitine;* but Tilloy of Dijon shewed that it was a compound with sugar, and that pure scillitine was insoluble in water, soluble in alcohol, but not in ether or in dilute acids. It melts by heat, swells up, and emits an aromatic, and then an urinous smell. Its taste is excessively acrid and bitter. A single grain killed a strong dog. The presence of sugar was proved, in Vogel's experiments, by the fermentation of the juice on the addition of yeast; and Tilloy succeeded in separating uncrystallizable sugar. The result of an analyzis of four ounces, or 1920 grains, by Buchner, was, water, 1517; extractive, containing the scillitine, 182; mucus, 76; phosphate of lime, 6; glutinous matter, 18; fibre, 65; with a trace of gallic acid.

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[*] *Syn.* Σκιλλα, (*Dios.*) Σκυλλα, (*Theoph.*) Scille maritime, Oignon marni, (*Fr.*) Meerziebel, (*Ger.*) Cipolla maritima, (*It.*)

In this country the squill is commonly met with in the shops in the form of the dried shreds, which should be brittle, semi-pellucid, white, smooth but marked with fibres, and when chewed should feel tenacious, and taste very bitter, without acrimony.

Med. use.—Given internally in full doses, it produces vomiting and purging, sometimes even strangury, bloody urine, inflammation and erosion of the stomach. In smaller doses, it is much more frequently exhibited as an expectorant, where the lungs are loaded with viscid matter, and as a diuretic in dropsical cases, for which purpose it is commonly conjoined with calomel.

The dose of squill is one or two grains three or four times a-day; and the most commodious form of its exhibition, unless when designed as an emetic, is that of a bolus or pill: in a liquid form it is to most people offensive, though often employed dissolved in spirit or vinegar.

From false analogy with the alliaceous bulbs, squill has often been represented to act as a general stimulant, while, on the contrary, I have always found it to be sedative, and to depress the vital powers.

Off. Prep.—Pulvis scillæ, *D. E.* Tinctura scillæ, *D. E. L.* Acetum scillæ, *D. L. E.* Pilulæ scillæ comp. *D. L. E.*

SCROPHULARIA NODOSA. *Dub.*

Willd. *g.* 1152, *sp.* 2; Spr. *g.* 2162, *sp.* 14; Smith, *g.* 285, *sp.* 1. *Didynamia Angiospermia.*—Nat. ord. *Personatæ*, Linn., *Scrophulariæ*, Juss.

Knotty-rooted figwort *.

Off.—The leaves.

FOLIA. *Dub.*

THIS is a perennial herb, growing in woods and under hedges. It flowers in July. The roots are grey and knotty, and have a nauseous smell, like a compound of raddish and peony, and a corresponding bitter, somewhat acrid taste, both of which they partly lose by drying. The infusion is reddish, and is blackened by persulphate of iron.

Med. use.—Its virtues are stated to be anodyne and repellent.

Off. Prep.—Ungt. scrophulariæ.

SENEGÆ RADIX. *Lond.* See POLYGALA.

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* *Syn.* Scrophulaire noueuse, (*Fr.*) Braunwurz, (*Ger.*) Scrofularia nodosa, (*It.*)

SENNA. *Lond. Dub.* See CASSIA.

SERPENTARIA. *Lond.* See ARISTOLOCHIA.

SEVUM. *Lond.* See OVIS.

SIMAROUBA. *Lond.* See QUASSIA.

SINAPIS.

Willd. *g.* 1246; Spr. *g.* 2325; Smith, *g.* 312. *Tetradynamia Siliquosa.*—Nat. ord. *Siliquosæ,* Linn., *Cruciferæ,* sect. *Sisymbriæ,* Juss.

Sp. 4. Willd.; *sp.* 19. Spr.; *sp.* 2. Smith. SINAPIS ALBA. *Ed. Dub.*

White mustard *.

Off.—The seeds.

SEMINA. *Ed. Dub.*

Sp. 6. Willd.; *sp.* 8. Spr.; *sp.* 3. Smith. SINAPIS NIGRA. *Lond. Dub.*

Common mustard.

Off.—The powder.

SEMINA. *Lond.* SEMINUM PULVIS. *Dub.*

BOTH species are indigenous, annual, and very common in corn fields and by road sides. The white mustard is sown in winter and early in spring, to be used as sallad. Its seeds are white or reddish, and of an orbicular shape. The seeds of the common mustard are smaller, subrotund, of an iron-brown colour, and minutely rugose on the surface. Their virtues and constituent principles are nearly similar, except that the black seems to be more pungent than the white. The episperm abounds in mucilage. Infused in water the seeds of white mustard form a thick liquid almost insipid, having the smell of sulphuretted hydrogen, and depositing a little sulphur on the transmission of chlorine gas. Black mustard seed gave very little mucilage, of a dirty green colour, and an acrid pungent taste. The entire seeds have no smell or taste, and when swallowed without chewing excite no sensation of heat in the stomach. In powder they have a very sharp pungent smell, causing a flow of tears when mixed with water, and a very hot, pungent, but transient taste. Powdered mustard has a bright yellow colour, an oily appearance, and cakes on pressure. By expression, mustard seeds yield about one-fifth of their weight of greasy fixed oil, having little smell and a sweet agreeable taste, of a greenish-yellow colour, sp. gr. 0.92, and congealing below the freezing point of water, soluble in four parts of ether and in 1000 of alcohol, and forming a very solid soap with soda. The cake which remains after the expression of the fixed oil is more pungent than before, which accounts for the difference between British and foreign flour of mustard, as the oil is not separated from the latter. By distillation, mustard cake yields a very pungent, acrid, volatile oil, smelling like horse raddish, of a golden yellow colour, holding in solution some sulphur, soluble in water and alcohol, and communicating to them its acrimony. The other principal constituent of the cake is albumen.

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* *Syn.* Σινηπι, (*Dios.*) Ναπυ, (*Hipp.*) Moutarde noir, Seneve noir, (*Fr.*) Schwarzer Senf, (*Ger.*) Senapa, Mostarda, (*It.*)

MM. Garot and Henry jun. by treating the expressed oil of mustard by alcohol, have obtained three new substances; *first*, a crystallizable greasy matter like cholesterine or ethale; *second*, a red colouring matter soluble in ether; *third*, a crystallizable acid consisting of carbon, sulphur, hydrogen, azote, and oxygen, to which they have given the name of sulpho-sinapic acid. But the existence of the acid has since been rendered doubtful by Hornemann, who considers it to be sulpho-cyanic acid combined with oil of mustard.

Med. use.—White mustard seed is swallowed entire, to the quantity of a table spoonful or more, to stimulate the stomach in some cases of dyspepsia, and to excite the peristaltic motion of the intestines, especially when they are torpid, as in paralysis. The powder of black mustard made into paste with water is commonly used as a condiment with animal food; infused in water, it proves emetic when taken in considerable doses, and in smaller ones acts as a diuretic and aperient; but it is more frequently applied externally as a topical stimulus, made into a paste, or sinapism, with vinegar and bread-crumb.

Off. Prep.—Infusum armoraciæ comp. *D. L.* Cataplasma sinapis, *D. L.*

SISYMBRIUM NASTURTIUM. *Ed.*

Willd. *g.* 1238, *sp.* 1; Smith, *g.* 306, *sp.* 1. *Nasturtium officinale*, R. Brown. Spr. *g.* 2307, *sp.* 19. *Tetradynamia Siliquosa.*—Nat. ord. *Siliquosæ*, Linn., *Cruciferæ*, sect. *Sisymbriæ*, Juss.

Common water cress *.

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* *Syn.* Σισυμβριον ἕτερον, (*Dios.*) Νεροκαρδαμον, (*Hod.*) Cresson d'eau, Cresson de fontaine, (*Fr.*) Quellranke, Brunnenkresse, (*Ger.*) Crescione, Nasturtio, (*It.*)

Off.—The recent herb.

HERBA.

THIS plant is perennial, and grows wild in clear springs and rivulets in every part of Britain. Its leaves remain green all the year, but are in greatest perfection in the spring. They have a pungent smell (when rubbed betwixt the fingers,) and an acrid taste, similar to that of scurvy grass, but weaker. By drying or boiling, they lose their sensible qualities entirely.

Med. use.—Water cresses are eaten as a spring salad. They act as a gentle stimulant and diuretic; for these purposes, the expressed juice, which contains the peculiar taste and pungency of the herb, may be taken in doses of an ounce or two, and continued for a considerable time.

SMILAX SARSAPARILLA. *Ed. Dub. Lond.*

Willd. *g.* 1800, *sp.* 9. *Diœcia Hexandria. Smilax officinalis,* Kunth; Spr. *g.* 1272, *sp.* 11. *Hexandria Monogynia.* —Nat. ord. *Sarmentaceæ,* Linn., *Asparargineæ,* Juss.

Sarsaparilla [*].

Off.—The root.

RADIX. *Ed. Lond. Dub.*

SARSAPARILLA is the product of tropical America, on both sides of the line. There is some uncertainty as to the botanical species furnishing it. The *Smilax sarsaparilla* of Willdenow is indigenous in Virginia, but none of the medicinal root is furnished by this species; the *S. glauca,* which yields the Brazil root, is only a variety. Willdenow, upon the authority of Humboldt and Bonpland, says that the medical root of Honduras and other parts of the Spanish Main is that of the *S. syphilitica,* or rather of a species separated from it by Kunth, and called *S. officinalis.*

There are several varieties of the root in commerce, which are named from some places connected with their importation or exportation. M. Guibourt, in his excellent History of Simples, has given a clear view of the commercial varieties of sarsaparilla. These are, 1*st,* that of Honduras, composed of very long roots often doubled in the bundles; 2*d,* the red, or bearded, called from its channel of importation Jamaica, but also the product of Honduras, distinguished by its colour and the presence of its radicles; 3*d,* the Brazilian, or, as it is called, Lisbon, without radicles, in bundles, and more trimmed and dressed than the others; 4*th,* Caraccas, also much dressed.

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[*] *Syn.* Salsepareille, (*Fr.*) Sassaparille, (*Ger.*) Salsapariglia, (*It.*)

Two spurious sarsaparillas must not be confounded with the genuine. The spurious red is the root of the *Agave Cubensis.* There is also a spurious grey sarsaparilla, which resembles very nearly in its external appearance that of Brazil. It is the root of the *Aralia nudicaulis.* The large roots are dotted with purplish spots, and there is not that white woody centre which all the known sarsaparillas exhibit. The roots of the *Carex arenaria,* abundant on sandy sea shores, are called German sarsaparilla, and used as a substitute.

Sarsaparilla root is about the thickness of a goose quill, and several feet in length, with joints at short distances. The cuticle is brown, with longitudinal plaits, and easily separated; the cortical part is white, grey or reddish, and of considerable thickness; the wood and pith are white, the latter thick in proportion to the former. It has a glutinous, bitterish, not ungrateful taste, and no smell.

The virtues reside solely in the cortical part, and are entirely extracted by water, even cold. Mr Pope found that the Jamaica contained the greatest quantity of soluble matter; the Lisbon the least, and the bark of the Jamaica five times as much as the wood. According to Mr Battley the soluble principle in the bark is scarcely acted upon by alcohol, unless greatly diluted. The infusion of the woody part, when acted upon by water acidulated with sulphuric acid, and concentrated, furnished crystals resembling discoloured ice.

The results of the analysis of sarsaparilla root by different chemists are exceedingly different, either from their examining different varieties, or using different methods of procedure. Pfaff got balsamic resin, 2; acrid extractive, 2.6; extractive resembling cinchonine, 3.8; albumen, 2.1; starch, a trace; woody fibre, 75.0; moisture, 2.9; and loss 0.7 = 100; on the other hand, Cannobio obtained bitter acrid resin, 2.8; gummy extractive, 5.5; starch, 54.2; woody fibre, 27.8; loss, 9.7 = 100. The difference, after all, is immaterial, and seems to have arisen from the difficulty of separating starch from woody fibre. Of its alleged active principles Professor Folchi's *smilacine* is very problematical. The same may almost be said of Dr Pallottas' *paragline.* M. Planche, who was repeating some of his experiments, has not communicated the results.

Med. use.—Sarsaparilla was first brought into Europe by the Spaniards about the year 1563, with the character of being a specific for the cure of the lues venerea, a disease which made its appearance a little before that time, and likewise of several obstinate chronic disorders. It then lost its reputation, and was considered by many as a very inert mucilaginous substance; while the diaphoresis, which it is sometimes supposed to produce, was entirely ascribed to warm and diluent regimen employed at the same time. More recently, however, it has come into favour for the cure of many cutaneous affections, and especially of what are called syphiloid diseases; and if upon just grounds, it will explain why it should have been so strongly recommended in syphilis, and why it should have failed to retain its reputation.

It is administered in the form of infusion, decoction, or of fluid extract, which has lately become so fashionable with many practitioners, that it is given largely in every chronic disease.

Off. Prep.—Infusum sarsap. comp. *D.* Decoctum sarsap. *D. L. E.* Decoct. sars. comp. *L.* Syrupus sarsap. *D.* Extractum sarsap. *D. L.* Extract. sarsap. fluidum, *D.*

SODÆ SUBCARBONAS IMPURUS, *vulgo* Barilla. *Ed.* SODA IMPURA. Subcarbonas sodæ impura. *Lond.* BARILLA. *Dub.*

Sodæ carbonas venale. *Dub.*

Impure subcarbonate of soda; impure soda; barilla. Commercial carbonate of soda [*].

SODA is a very common mineral production. It is found native on the surface of the earth, and on the margin of certain lakes in various parts of the world, especially in Egypt and other parts of north Africa, where it is called *Trona.* It occurs in two states, one in yellowish flakes, and the other in solid radiated masses. The latter is much less impure than the former, and is in fact a sesquicarbonate. The native soda does not now occur in commerce, although formerly it was imported from Egypt.

BARILLA is obtained by the incineration of marine vegetables, especially the *salsola soda* and *kali*, the *salicornia herbacea*, &c. The Spaniards even cultivate these in salt marshes for the sake of the soda. After being cut down, they are dried like hay. A deep pit is then prepared, and a bundle or two of the dried vegetables set on fire are thrown into it. After being well kindled, other bundles are thrown in until the pit is filled. When the incineration is completed, the barilla is found in the bottom, caked into a solid mass, which is worked like a stony substance.

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[*] *Syn.* Natron, Nitrum, (*Pliny,*) Trona, (*Egypt,*) Alkali minerale crudum, Sal sodæ crudum, Natrum carbonicum crudum, (*Pharm.*) Soude impure, (*Fr.*) Rohe Soda, (*Ger.*) Soda impura, (*It.*) Karum, Poonheer karum, (*Tam.*) Kar, Sedgie muttie, Sagilon, Chinkaloon, (*Hind.*) Charum, (*Mal.*) Sarjica, Sarjikashara, (*Sans.*) Savïttie munnoo oopoo, (*Tel.*) Jumed chenee, (*Arab.*) Suja cura, (*Can.*) Booniroo, (*Tel.*)

The Spanish Barilla, which is the best, contains only from 25 to 40 *per cent* of carbonate of soda; the remainder consists of sulphate and muriate of soda, and of potass, with some iodine and earthy impurities. A very impure kind of barilla, called Kelp, is procured by incinerating the *fuci* which grow in abundance on the rocks of the Orkney and Western Islands. It does not contain above 3 to 8 *per cent.* of alkali.

Good barilla is firm, hard, heavy, dry, sonorous, spongy, and internally of a blue colour mixed with white spots, does not deliquesce, emits no unpleasant smell on solution, and does not leave a large proportion of insoluble matter.

Off. Prep.—Sodæ carbonas, *D.* Sodæ sub-carbonas, *L. E.*

SODÆ CARBONAS VENALE, *Dub.* For medical purposes, barilla is now altogether superseded by the carbonate of soda, which is prepared in immense quantities by the decomposition of salts of soda. I am indebted to Mr Steele, Lecturer on Chemistry at Paisley and Glasgow, for the following account of the process for obtaining soda, by decomposing the sulphate of soda, or the mixed salts known in commerce by the name of Soapers salts. " The soapers salts remain, after kelp has been subjected by the manufacturer of hard soap to the process for separating carbonate of soda. They consist almost entirely of a mixture of the muriates and sulphates of soda and potash, with a little animal matter, and a small quantity of the carbonate of soda which has escaped separation.

When sulphate of soda is employed, it is generally decomposed in the following manner. About 5 cwt. of sulphate of soda, 2 cwt. of saw-dust, 50 lbs. of lime, and a small quantity of iron-filings, or borings, are ground together, and the mixture is exposed in a reverberatory furnace until it becomes pasty. By this process the carbon of the saw-dust combines with the oxygen of the sulphuric acid, and forms carbonic acid, while the sulphur of the sulphuric acid is in part sublimed, and the rest combines with the lime and iron, and forms sulphurets. The mixture is then transferred from the furnace into large cisterns with double bottoms, and lixiviated to separate the sulphurets and other impurities. The ley is afterwards evaporated to dryness; but as the dry mass which is formed still contains a little sulphate of soda, the whole of the preceding process is repeated to decompose the remainder of that salt. It is obvious that the strong heat which is necessary to destroy the sulphuric acid will prevent the soda from combining with a sufficient quantity of carbonic acid to constitute a carbonate. The dry mass which remains after the evaporation of the second ley is therefore put into a reverberatory calcining furnace, with a quantity of saw-dust or any carbonaceous matter, and exposed to a heat sufficient to convert the carbon into carbonic acid, and to allow that acid to unite in its proper proportion with the soda. This process completes the formation of the carbonate of soda, which is now withdrawn from the furnace and lixiviated, after which the solution is crystallized in a temperature which should not exceed 55°. If the temperature be higher, crystals will not form.

As soapers salts are principally a mixture of sulphates and muriates, it is evident, that when soda is procured from them, part of the process will be intended to decompose the sulphates, and part the muriates. That which relates to the sulphates has been already explained; and that which relates to the muriates will be best understood by describing the decomposition of unmixed muriate of soda. Soda may be procured from this salt, but in the present state of the market not with so much advantage as from sulphate of soda or soapers salts. When muriate of soda is employed, the following process is followed.

Saturated solutions of equal quantities of the muriate of soda, and the pot or pearl ashes of commerce, are mixed together, and then boiled for a short time till a pellicle appears on the surface of the liquid. It is then watched with great care till it shews signs of salting. The solution is now run into a cooler, to allow the muriate of potash to crystallize; and when the whole of this salt has separated, the supernatant liquid which contains soda in a somewhat caustic state is evaporated to dryness. The potash employed in the manufacture of soda is rather caustic, owing to the heat employed in its preparation having deprived it of a portion of acid: hence, when solutions of this salt and of the muriate of soda are mixed, the carbonate of soda which is produced is deficient in carbonic acid. The dry mass is therefore mixed with a quantity of saw-dust, and exposed to a low red heat in a reverberatory calcining furnace, till it combines with a sufficient quantity of carbonic acid. It is then withdrawn from the furnace, and lixiviated, and the solution crystallized in a temperature which should not exceed 50° or 55°.

In the manufacture of soda from soapers salts, the muriate of potash is the only salt which remains unchanged; the sulphate and muriate of soda and the sulphate of potash are decomposed. The process which destroys the sulphuric acid of the sulphate of soda, and converts that salt into a carbonate of soda, produces a similar change on the sulphate of potash, converting it into a carbonate of potash, which immediately acts on the muriate of soda that happens to be present, disengaging its alkali, which thus augments the desired product. The heat to which the soapers salts are exposed, destroys the animal matter they contain.

Soda is sometimes prepared by decomposing its muriate by litharge or subcarbonate of lead, or by decomposing its sulphate by acetate of lime. The acetic acid, for this purpose, is obtained by distillation from wood during its conversion into charcoal.

Carbonate of soda is an article of the greatest importance in many manufactures."

Med. use.—Carbonate of soda is now much employed in medicine. Its primary effect is to saturate any acids which may exist in the stomach, and subsequently, by absorption, it renders the urine alkaline. It is therefore administered with success in all cases of acidity of the stomach, and indigestion connected with acidity. In consequence of neutralizing the hurtful acid, it sometimes acts as a tonic. It is likewise useful in all cases of acid diathesis, as in gout, and uric acid calculus.

It is given in doses of from 5-20 grains, either in powder or exsiccated, or in solution in bitter infusions. It is sometimes employed with the intention of increasing the solvent power of water in extracting the virtues of vegetable substances; but this is doubtful, and the belief has probably originated in all vegetable yellow colours being deepened by alkalis.

SODÆ BORAS; S. S. Sub-boras sodæ. *Lond.* BORAS SODÆ, *vulgo* Borax. *Ed.* BORAX. *Dub.*

Borate of soda. Sub-borate of soda. Borax [*].

BORAX is either natural or artificial. Native borax is found both in central Asia, and in South America. It is contained in the water of certain lakes, and is either collected where it has been crystallized by accidental evaporation, or the water is conducted into shallow pits, and allowed to evaporate. Crude borax, called *Tincal*, is chiefly gathered in

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[*] *Syn.* Tincal, Pounxa, (*native names*,) Borax cru, (*Fr.*) Naturlicher Borax, (*Ger.*) Borace nativo, (*It.*) Velligarum, Vengarum, (*Tam.*) Lansipooscara, (*Cyn.*) Sohaga, (*Duk. Hind.*) Patterie, (*Malay.*) Buruk, (*Arab.*) Tunkar, (*Pers.*) Piger, (*Malay, Java, Bali.*) Tunkana, (*Sans.*) Chaularya, (*Nep.*)

Thibet; but three varieties are distinguished in commerce. Indian borax, consisting of small, more or less impure, crystals; Bengal or Chandunagur borax in large roundish crystals; and Chinese borax, half-refined, consisting in crusts having much of the appearance of sugar of milk. Crude borax is in very short hexahedral prisms, more or less flattened, and pretty regularly pointed; colourless, yellowish, or greenish, always imbedded as in a matrix in a pale earthy coating, greasy to the touch, and having the smell of soap. This oily matter greatly impedes the purification of borax, which was long preserved as a secret by the Venetians and the Dutch. It is however saponifiable, and, according to Robiquet and Marchand, may be removed by lime, after which the refining may be completed by dissolving the borax, adding a solution of muriate of lime, and very slow crystallization.

Borax is also prepared by directly combining boracic acid with soda. Höfer and Mascagni discovered, in 1776, that some warm springs in Tuscany contained boracic acid, and that the soil around them was impregnated with it. This earth is now lixiviated with the hot water of the spring, and evaporated to the point of crystallization, when the acid separates in small greyish plates. In this state it is mostly carried to France, and there converted into borax by carbonate of soda.

Refined borax commonly occurs in tolerably large, white, firm, semitransparent shining crystals, rarely forming regular hexahedral prisms of two broad and four narrow sides terminated by triangular prisms, having a shining, flat, conchoidal fracture. It has a mild sweetish taste, afterwards alkaline and bitter, becomes opaque in the air, and covered with a white powder, soluble at 60° in twelve waters, and at 212° in two, and totally insoluble in alcohol. When heated it first melts, then boils up and yields a light, spongy mass, by the expulsion of its water of crystallization. In a higher degree of heat it melts into a transparent glass, called Vitrified borax.

A variety of borax occurs in regular octohedral crystals. It is firmer and harder, and does not effloresce in dry air. It contains but half the water of crystallization that is in common borax. It is obtained by dissolving borax in water in such proportion, that the solution at 212° has the sp. gr. of 1.246. When the temperature falls to 174°, octohedral crystals begin to separate, and continue to be formed until the temperature sink to 132°, below which only prismatic crystals form. By analysis anhydrous borax consists of 30.95 soda, and 69.05 boracic acid; octohedral borax of 21.45 soda, 47.78 acid, and 30.81 water; and prismatic borax of 16.37 soda; 36.52 acid, and 47.11 water. From its alkaline properties it is generally considered to be a *subborate;* but Dr Thomson, from his estimation of the equivalent numbers of boracic acid, makes it a *biborate.* Besides the acids and alkalies, which have a greater affinity for boracic acid or soda than these have for each other, borax is decomposed by the sulphates, muriates, nitrates, phosphates, and fluates, of all the earths, and of ammonia.

Borax has the singular property of forming a quadruple salt with cream of tartar, which is exceedingly soluble and not crystallizable, but by evaporation is converted into a viscid fluid like thick syrup, and lastly into a homogeneous transparent gummy mass. The Prussian Pharmacopœia fixes the proportions at one of borax to three of cream of tartar. According to the atomic doctrine, they should be 19 borax and 24.75 tartar. It used to be called *Soluble cream of tartar*, and furnishes a means of giving large doses of that insoluble salt in solution. Another peculiarity of borax is its property, even in the state of solution, of converting the mucilage of gum arabic, Iceland moss or salep, into a gelatinous mass, without any adhesive property, and which is redissolved by the addition of sugar even in powder.

Med. use.—The medical virtues of borax have not been sufficiently ascertained by experience: it has been supposed to be, in doses of half a drachm or two scruples, diuretic and emmenagogue, and it has been given to promote labour pains. According to Wurzer it is the most powerful solvent of uric acid, and the best remedy in calculi of that substance. Mr Bisset recommends a solution of the salt in water, as the most powerful dissolvent yet known of aphthous crusts in the mouth and fauces of children; and for the same purpose, it is often applied, in the form of powder, mixed up with sugar.

Off. Prep.—Mel boracis, *D. E. L.*

MURIAS SODÆ. *Ed.* SODÆ MURIAS, s. s. Murias sodæ. *Lond. Dub.*

Muriate of soda. Common sea-salt *.

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* *Syn.* Sel commune, (*Fr.*) Rochsalz, (*Ger.*) Sale commune, (*It.*) Oopoo, (*Tam.*) Nemuck, (*Pers.*) Nemuck, (*Duk. Hind.*) Loonoo, (*Cyng.*) Loon, (*Hindooie,*) Lavana, (*Sans.*) Lawanum, (*Tel.*) Garum, (*Mal.*) Uyah, (*Jav. Bali.*) Mehl, (*Arab.*) Meet, (*Mal.*) Yen, (*Chin.*)

This is the most common of all the neutral salts. It is not only found in immense masses on and under the surface of the earth, and contained in great abundance in many salt springs, but it is the cause of the saltness of the sea.

There are two varieties of native muriate of soda, the lamellar and fibrous. It is found in Poland, Hungary, Spain, England, &c. When necessary, it is purified by solution and crystallization.

Salt springs occur in many parts of the world. The quantity of muriate of soda contained in these varies from an inconsiderable quantity even up to one-third.

Sea-water also varies much in strength. It is said to contain most salt in warm climates, and at great depths. According to Dr Murray's analysis, sea-water in the Frith of Forth contains in a pint, soda 96.3 grains; magnesia 14.8; lime 2.9; muriatic acid 97.7; sulphuric acid 14.4=226.1.

Muriate of soda, as obtained from its natural solutions by evaporation and crystallization, is commonly mixed with earthy muriates, which, being deliquescent salts, dispose it to attract moisture from the atmosphere. It may, however, be purified by precipitating the earths by means of carbonate of soda, or by washing the crystallized salt with a saturated solution of muriate of soda, heated to ebullition. In this state it is not capable of dissolving any more muriate of soda, but will dissolve a considerable quantity of the earthy muriates.

There are two doctrines concerning the constitution of sea-salt; the older considers it as composed of muriatic acid 4.625 and 4. soda=8.625; the newer, that of Sir H. Davy, of chlorine 4.5 and sodium 3=7.5, in whose nomenclature it is therefore called *Chloride of Sodium;* the French call it *Clorure* or *Chloruret of sodium.* But even according to this doctrine it becomes muriate of soda as soon as it comes in contact with water; the chlorine being acidified by the hydrogen, and the sodium oxidized by the oxygen of a proportion of the water.

Muriate of soda has a pure salt taste, is soluble in 2.8 times its weight of water at 60°, and in 2.76 at 212°. It is not soluble in alcohol. By the action of heat it first decrepitates, then melts, and lastly sublimes without decomposition. The primitive form of its crystals is cubic, and they are permanent in the atmosphere. It is decomposed by the sulphuric and nitric acids, by potass and baryta, by secondary salts containing these, and by metalline salts whose base forms an insoluble compound with muriatic acid: it is also gradually decomposed by lime, iron, and litharge.

Med. use.—Muriate of soda is one of the most important articles in the arts, and in domestic economy. As a medicine, it is useful in some cases of dyspepsia; and in large doses it is said to check vomiting of blood. It is a common ingredient in stimulating clysters, and is sometimes applied externally, as a fomentation to bruises, or in the form of bath, as a gentle stimulus to the whole surface of the body.

Off. Prep.—Calomelas præcipitatum, *D. E.* Hydrargyri submurias ammoniatum, *D.* Pulvis salinus compositus, *D. E.* Acidum muriaticum, *D. E. L.* Aqua chlorinii, *D.* Hydrargyri submurias, *L. D.* Hydr. oxymurias, *L. E. D.*

SODÆ SULPHAS; s. s. Sulphas sodæ. *Lond.*

Sulphate of soda.

THIS salt is now for the first time introduced into the Materia Medica of the London College, while a formula is given by all the Colleges for its preparation, to the observations on which I refer.

SOLANUM DULCAMARA. *Lond. Dub.*

Willd. *g.* 383, *sp.* 15; Spr. *g.* 747, *sp.* 21; Smith, *g.* 100, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solanaceæ*, Linn. Juss.

Bitter-sweet. Woody nightshade *.

Off.—The twigs.

CAULIS. *Ed. Lond. Dub.*

THIS climbing shrub grows wild in moist hedges, attains 10–15 feet in height, has woody brittle stalks, and flowers in June and July. The twigs in the second or third year of their growth should be gathered every autumn after the fall of the leaf. They should have the thickness of a goose quill, or a little more. The epidermis is pale yellow, the bark green, and the pith spongy. When fresh, on being bruised, they gave out an unpleasant, nauseous, narcotic smell, which they lose by drying. Their taste is at first distinctly bitter, but they leave a soft, sweetish after-taste in the mouth.

The dulcamara twigs have been analyzed by Professor Pfaff, who got, besides a very volatile narcotic principle, a peculiar bitter principle of a honey smell and sweet after-taste, (*Picro-glycion*,) forming about one-fifth. The other principles were of less importance. M. Desfosses got a narcotic principle, solanine, from the berries of the *Solanum nigrum* and *S. dulcamara*, as well as from the twigs of the latter species, whereas the leaves of the former did not contain it, nor the berries of the *S. tuberosum*. In the dulcamara he also got a sweet substance, to which he gave the name of *Dulcarine*, but it is probably only a modification of uncrystallizable sugar. MM. Chevallier and Payen have found this alkaloid also in the *Solanum verbascifolium*. It was thought that the berries of the bittersweet, which assume a fine red colour when arrived at maturity, were poisonous; but M. Dunal has shown that this was an error. Another species of *Solanum*, the *Pseudoquina* of Brazil, has been analyzed by M. Vauquelin, who has found its active principle to resemble *Colocynthine*, in being precipitated by infusion of nut-galls, but not by acetate of lead or nitrate of silver. Pulverulent solanine is white, inodorous, rather bitter, little soluble in water, more soluble in alcohol. It is prepared by precipitating the juice of the *morelle*, or the decoction of that plant by ammonia. The precipitate is collected, dried, and then treated by boiling alcohol, which on cooling deposits the solanine. The salts of solanine are neutral, bitter, and crystallizable.

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* *Syn.* Douce-amère, (*Fr.*) Kletternder Nachtschattey, (*Ger.*) Solatro dolceamaro, (*It.*)

Solanine seems to possess considerable power as a narcotic. Two grains affected a young dog. Dr Schlegel also has related cases in which the decoction of dulcamara, and its extract, produced narcotic effects. In the last case, a young man with a cutaneous complaint had taken the decoction of a handful of the fresh twigs daily for fourteen days without any effect. On the fifteenth, having taken also an ounce of the extract in solution, he was seized with cramps in the calves of the legs, slept during the whole night, but on awakening in the morning found his head vacant, (wust,) vertiginous, *muscæ volitantes;* pupils greatly dilated; cramp of the legs and arms; inability to speak, with swelled stiff tongue; pulse slow and intermitting; cold sweat, and trembling of the limbs. These symptoms soon went off after taking a solution of subcarbonate of potass.

Med. use.—The dulcamara was formerly much esteemed. It is said to excite the heart and arteries, to increase all the secretions and excretions, and in large doses to produce nausea, vomiting, and convulsions; but its effects are seldom obvious, although from its analysis it is proved to possess narcotic power. It has been recommended in cutaneous affections, especially lepra, and in syphiloid diseases, in rheumatic and cachectic swellings, in ill-conditioned ulcers, scrofula, indurations from milk, leucorrhœa, jaundice, and obstructed menstruation. It has principally been used in decoction as a diet drink: two or three ounces of that of the London Pharmacopœia may be given thrice a-day, and gradually augmented, till a pint be consumed daily. A stronger decoction may be used externally as a lotion. In the form of extract, from 5 to 10 grains may be given for a dose.

Off. Prep.—Decoct. dulcamaræ, *D. L.*

SPARTIUM SCOPARIUM. *Ed. Dub. Lond.*

Willd. *g.* 1332, *sp.* 19; Smith, *g.* 321, *sp.* 1; *Genista scoparia,* Lamarck; Spr. *g.* 2529, *sp.* 25. *Diadelphia Decandria.*—Nat. ord. *Papilionaceæ,* Linn., *Leguminosæ,* sect. *Papilionaceæ,* Juss.

Common broom *.

Off.—The tops.

SUMMITATES. *Ed.* CACUMINA. *Lond.*

THE broom is a very common shrub on natural pastures. It grows from 5 to 10 feet high, or even more. It flowers in June or July. The twigs are alternate, slender, flexible, pentangular, smooth, and of a bright green. The leaves are small, oblong, single or ternate, and have short footstalks. The flowers are papilionaceous, and yellow. The smell of the whole plant when bruised is strong and peculiar; the taste bitter and nauseous. I do not know of any analysis of the broom; but, from analogy, I suspect that it may contain *cytisine.*

Med. use.—The twigs when given in decoction prove considerably diuretic. The seeds have similar properties.

Off. Prep.—Extractum spartii scoparii, *D.*

SPERMACETI; ex Physetere macrocephalo. *Ed.* CETACEUM; concretum sui generis. *Lond. Dub.*

Spermaceti †.

THE spermaceti whale is characterized by his enormous head, great part of which is occupied by a triangular cavity of bone, covered only by the common integuments. In the living animal, this cavity is filled with a white, fluid, oily substance, amounting sometimes to many tons in weight. On the death of the whale, it congeals into a white unctuous mass, from which a considerable quantity of very pure whale oil is obtained by expression. The residuum, afterwards freed from impurities, by washing with water, melting, straining, expressing through linen bags, and, lastly, washing in a weak ley of potass, is the peculiar substance well known by the name of *Spermaceti*, for which, probably on account of its conveying an incorrect idea of the nature of the substance, the London College has substituted *Cetaceum*, which has been adopted by other colleges. Spermaceti is also contained in solution in the common whale and other fish oils; for it is often found deposited, by crystallization, in the reservoirs containing them.

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* *Syn.* Genet à balais, (*Fr.*) Geniste, Pfriemenkraut, (*Ger.*)

† *Syn.* Adipocera cetosa, (*Phar. Bav.*) Blanc de baleine, (*Fr.*) Wallrath, (*Ger.*) Bianco di balena, (*It.*)

Spermaceti, as it occurs in commerce, is of a white colour, and has a foliated crystalline texture. Its plates have a peculiar lustre, are transparent, brittle, smooth and slippery, but not greasy to the touch; taste bland and insipid; smell peculiar but weak; sp. gr. 0.948; harder than tallow; melts at 120°; does not make a greasy stain upon paper; kindles readily at a higher temperature, and burns with a brilliant flame without smell. It is sublimed in close vessels, mostly unchanged; but there is also formed a colourless fluid oil, oleic, margaritic and acetic acids, water, odorous matter, yellow matter, and a yellow empyreumatic oil. In boiling alcohol it is almost entirely soluble, but it is chiefly deposited on cooling. 150 parts of alcohol are required to dissolve one of spermaceti. It is soluble in ether, especially when hot, and partly crystallizes from it on cooling, and is also soluble in volatile and fixed oils. It is not acted upon by the acids, except the nitric, which dissolves it, and from which it is precipitated unchanged on dilution with water. With the fixed caustic alkalies, it yields a very brittle, friable soap, which does not make a perfectly clear solution with water. When the soap is decomposed by tartaric acid, there are formed acetic acid, mucous syrup, and a yellow mass, which consists of oleic and margaric acid, and of a modification of spermaceti, to which Chevreul has given the appellation of *Ethal*. Heated with ammonia, it forms an emulsion, which is not decomposed on cooling, nor on the addition of an acid, but readily by acids.

According to Chevreul, commercial spermaceti retains a little oil, from which it can be freed by solution in boiling alcohol. On cooling, the *cetine* crystallizes in fine white scales having a pearly lustre; and in this state it is harder, more shining and less greasy to the touch than spermaceti.

By exposure to the air it is apt to become yellow and rancid, and therefore should be selected recent and quite white.

Med. use.—Spermaceti used to be administered internally as a demulcent in pectoral complaints. It may be powdered by adding a little alcohol; but it was chiefly given in the form of an emulsion, made with mucilage or yolk of an egg. It is used externally in the form of an ointment.

Off. Prep.—Unguent. cetacei, *L. D.* Ceratum simplex, *E.* Ceratum cetacei, *L.*

SPIGELIA MARILANDICA. *Ed. Lond. Dub.*

Willd. *g.* 308, *sp.* 2; Spr. *g.* 634, *sp.* 5. *Pentandria Monogynia.*—Nat. ord. *Stellatæ,* Linn., *Gentianeæ,* Juss.

Carolina pink *.

Off.—The root.

RADIX. *Ed. Lond. Dub.*

THIS plant is perennial, indigenous in Carolina and in the southern parts of North America. It is the *Unsteetla* of the Cherokees. It has a fibrous root, and a simple, straight, round, slightly quadrangular stalk, which has at the top sessile, opposite leaves, ovate, smooth, pale green on the lower surface, and marked with prominent ribs arising from the central rib. The herb smells like tea, and has a somewhat bitter taste. The root has little smell, and a bitter astringent taste.

Feneuille has analyzed both the herb and the roots. The active principle is more abundant in the roots than in the leaves. It is a nauseous bitter substance, resembling the purgative principle in the leguminous plants. Taken internally, it causes vertigo and a kind of intoxication, which corresponds with Bigelow's statement, that good spigelia produces slight narcotic effects in a full dose. The active principle would also seem to be destructible, for the drug is considered to be more active in its newly dried state than after it is six months old.

Med. use.—The root is celebrated as anthelmintic, particularly for the expulsion of lumbrici from the alimentary canal, and it often affords relief where no worms are discharged. Some order it in doses of ten or fifteen grains, while others give it in drachm doses, alleging that the nervous affections, which it sometimes produces, more readily happen from small doses, as the large ones often purge or puke. It is also given in the form of infusion. An emetic is generally premised; and its purgative effect is assisted by some suitable additions. Infused in wine, it has been found useful in intermittents. Dr Barton recommends it in the insidious remitting fever of children, which often lays the foundation for hydrocephalus.

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* *Syn.* Spigelie du Maryland, (*Fr.*) Spigelie, (*Ger.*) Spigelia, (*It.*)

SPIRITUS RECTIFICATUS. *Dub.* See ALCOHOL FORTIUS.

SPIRITUS TENUIOR. *Dub.* See ALCOHOL DILUTIUS.

SPONGIA OFFICINALIS. *Ed. Dub. Lond.*
Cl. *Zoophyta.* Ord. *Spongia.*
Sponge [*].

SPONGIA OFFICINALIS. *Ed. Dub.* SPONGIA. *Lond.*

SPONGE is principally found in the Mediterranean and Red Seas. It was long supposed to be a vegetable production, but it is now universally allowed to belong to that remarkable class of animals called Zoophytes, which are negatively characterized by Cuvier, as having no vertebræ, no sanguiferous vessels, no spinal marrow, and no articulated limbs. The sponges belong to that division of the zoophytes, which are attached to a solid trunk, and are particularized by their base being spongy, friable, or fibrous.

Sponge consists entirely of an intricate web of very fine, flexible, corneous fibres, in variously formed masses, porous, light, elastic, bibulous, of a yellowish-brown colour, and often containing bits of coral or stone. They are naturally attached to the rocks, and other solid bodies submersed at various depths in the ocean. Their collection constitutes a considerable occupation for the inhabitants of the islands of the Greek Archipelago. Before they are sent to market, they are freed, by washing, from a gelatinous slime, which covers their surface. Their price varies exceedingly, according to the fineness of their texture. In selecting sponges for medical use, attention must be paid to the purpose to which they are to be applied. For internal use, their physical qualities are of little importance, and the chief object is to get them as much in their natural state as possible. For external use, as well as for domestic purposes, they are chosen for the elasticity, softness, and fineness of their texture; and they are prepared by washing them anew, and freeing them, by beating, of all shells and stony matter. They are even bleached to deprive them of colour.

The results of their analyses by different chemists are various, probably depending in part on their previous preparation and diversity of species; but they may be in general said to contain, besides animal matter, chloride of sodium, iodine, phosphorus, lime, magnesia, silex and iron, and, according to Jonas, bromine.

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[*] *Syn.* Σπογγος, (*Arist.*) Sponges, (*Fr.*) Saugschwamm, Badeschwamm, (*Ger.*) Spugna, (*It.*) Isfenj, *Arab.*) Abermoordeh, (*Pers.*) Mooabadul, (*Hind.*) Uniwatta, (*Japan.*)

Med. use.—From its physical properties, sponge is an useful substance in the practice of surgery. When applied to ulcers, which are accompanied with a copious discharge, it absorbs the thinner and more acrid fluid, and leaves the ulcers covered with the thicker and blander matter. It is also useful in suppressing hæmorrhagies, when properly applied by compression, by favouring the coagulation of the blood at the mouths of the vessels. It also forms a convenient tent for dilating wounds and fistulous ulcers, especially when prepared by immersing it in melted wax and oil, and keeping it compressed until it cools. On the melting of the cerate, by the heat of the part to which it is applied, the sponge gradually expands, and affords an uniform and gently dilating pressure.

Arnold of Villanova employed burnt sponge with good effect in scrofula; and Dr Russel in the same disease used burnt tangle and fresh tangle poultices. Both have continued to be popular remedies. Since the discovery of the specific effects of iodine, a rational explanation can now be given of what was considered to be a popular prejudice.

Off. Prep.—Pulvis spongiæ ustæ, *D. L.*

STALAGMITIS CAMBOGIA. *Dub.* See GAMBOGIA.

STANNUM. *Lond. Ed. Dub.*

Off.—a) Tin-filings *.

LIMATURA STANNI. *Lond. Dub. Ed.*

b) Powder of tin.

PULVIS STANNI. *Dub. Ed.*

TIN is a brilliant-white metal, sapid and odorous; specific gravity 7.291 to 7.500; soft, flexible, and emitting a crackling noise when bent; very malleable; fuses at 442° Fahrenheit; oxidizes slowly in the air; is converted, when fused, into a grey oxide; when red hot it burns vividly. Sulphuret and phosphuret are lamellated and brittle. Tin forms alloys with arsenic, bismuth, antimony, mercury, and zinc; it is oxidized by many acids, and combines with the muriatic, fluoric, boracic, and carbonic acids.

It is found, 1. Sulphuretted and combined with copper; Tin pyrites. 2. Oxydized: *a.* Combined with oxide of iron and silica; Common tinstone. *b.* Combined with oxide of iron, and a little arsenic; Fibrous tinstone.

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* *Syn.* Etain, (*Fr.*) Zinn, (*Ger.*) Stagno, (*It.*) Tagarum, (*Tam.*) Runga, (*Duk. Hind.*) Urzeez, (*Pers.*) Tima, (*Mal.*) Trapu, Ranga, (*Sans.*) Kulai, (*Hind.*) Resas, (*Arab.*) Galai, (*Turk.*) Yang-seih, (*Chin.*)

The best tin is found in Cornwall, or is brought from the East Indies. Its purity is estimated by its small specific gravity, and by the crackling noise it makes when bent.

Med. use.—It was used in medicine only as an anthelmintic, especially in cases of tænia, and probably acted mechanically; but it is now laid aside.

STAPHISAGRIÆ SEMINA. *Lond.* See DELPHINIUM.

STRAMONIUM. *Lond. Dub.* See DATURA.

STRYCHNOS NUX VOMICA. *Dub.*

Willd. *g.* 385, *sp.* 1; Spr. *g.* 741, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Contortæ*, Linn., *Strychneæ*, Juss.

Poison-nut tree *.

Off.—The seeds called Nux vomica. Poison nut.

NUX VOMICA.

THE tree which furnishes these seeds is indigenous in Ceylon, Malabar, and Coromandel. Its trunk is short and crooked, and its branches irregular.

The wood is exceedingly bitter, especially that of the root, which is used for the cure of agues, and against the bite of poisonous snakes; but Dr Roxburgh does not think that it is the *Lignum colubrinum* of the shops.

The fruit is about the size of an orange, monolocular, covered with an orange-coloured, smooth, hard and brittle rind, containing from 2 to 5 seeds, imbedded in a soft jelly-like pulp, which is eaten greedily by many birds.

The seeds are discoid, weighing about 20 grains each, about a line in thickness, and 6–8 in diameter, flat, with an umbilical elevation on one side, and a corresponding depression on the other; of a whitish, yellowish or ash-grey colour, covered with fine shining diverging hairs, of an ash-grey or yellow-grey colour; episperm yellowish, fragile, and not bitter; kernel yellowish or brown, having a weak, peculiar, somewhat nauseous balsamic smell, and an intense, durable, bitter taste, with no flavour. They are hard, horny and elastic, and very difficultly pulverizable. The powder is of a greyish colour.

Nux vomica has been analyzed by Destouches, Braconnot, and most perfectly by Pelletier and Caventou. Besides gum, starch, and bassorine, concrete oil, wax and colouring matter, it contains a peculiar acid, the igasuric, or strychnic, and, like some of the cinchonas, two bases, having considerable analogy, yet sufficiently distinct, to which Pelletier and Caventou have given the names of *Strychnia* and *Brucea*, and which are its active principles.

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* *Syn.* Noix vomique, (*Fr.*) Krähenaugen, Brechnusse, (*Ger.*) Noce vomica, (*It.*) Yettie cottay, (*Tam.*) Moostighenza, Musadi, (*Tel.*) Culake, Kutaka, Veshamoostibeejum, (*Sans.*) Kodakaddooruatta, (*Cyng.*) Koochla, (*Duk. Hind.*) Khanekulkelb, (*Arab.*) Jawuz alkie, (*Serapis,*) Ma-tseen, (*Chin.*)

Strychnia crystallizes in very much elongated octohedrons, or in grains. Taste insupportably bitter, and afterwards somewhat metallic; smell none; permanent in the air; decomposed about 600° F. previously melting, and yielding a black spongy coal, and a little ammonia, with the usual products; requiring 6667 of water at 60°, and 2500 at 212°, for its solution; easily soluble in alcohol, even when not absolute; sparingly if at all in ether; soluble in volatile oil, especially when hot; sparingly in fixed oil; alkaline in its reaction, and forming salts with acids. Its composition, according to Pelletier and Dumas, is carbon, 78.22; hydrogen, 6.54; nitrogen, 8.92; and oxygen, 6.38.

The salts of strychnia are intensely bitter and unpleasant. They are precipitated by tannine, and when dry generally assume a red colour with nitric acid; but this colour indicates the presence of brucea, and even then depends upon a foreign matter. The saturating power of strychnia is very small, 2.0925, and its neutral salts consist of three atoms of base, and two of acid.

The action of nux vomica, and subsequently of its active principles, on the animal economy, was ascertained, by Magendie and Delisle, to consist in producing tetanus by acting upon the spinal cord, without directly affecting the functions of the brain. An animal under its influence, as often as it is touched, is violently concussed, as if it had received an electric shock. This I have also observed in a gentleman when narcotized by strychnia. On the brain and cerebral nerves its action was not very manifest. In no case was any thing like delirium induced, but in one there was some dilatation of the pupil, with *muscæ volitantes.* It causes death by asphyxia, and leaves no organic change.

Med. use.—It has long been a popular remedy in India for various diseases, especially partial loss of sensation, which is supposed to be the forerunner of leprosy; as a prophylactic against hydrophobia, and in anasarca after fever. In Europe it has been also long used in agues, hemicrania, intestinal worms, hypochondriasis, hysteria, spasmodic asthma, nervous colic, gout, rheumatism, the plague, dysentery, chronic diarrhœa, and convulsive diseases. More recently, in consequence of its peculiar action being ascertained by

Magendie, it has been much prescribed, in its more active forms, in paralytic affections of the voluntary muscles, by Fouquier and others in France, and by Dr Bardsley, myself, and others in Britain. The general result seems to be as stated by M. Bayle. It is indicated in all palsies without lesion of the cerebro-spinal apparatus, such as result more commonly than is believed, from rheumatism, gout, hysteria, lead, scurvy, commotion, nervous weakness, &c.; it is more successful in paraplegial and general palsies than in hemiplegia; it is successful in incontinence of urine from palsy of the sphincter, in palsy of the bladder, and even in amaurosis; it suppresses, and very speedily cures dysentery, and sometimes suspends epilepsy, and lessens its severity.

Nux vomica is given in the form of powder, but it cannot be powdered except when heated, or after having been steamed for some hours, and afterwards stove-dried. The powdered nux vomica in the shops is often adulterated with sea-salt. The Hindoos use it slightly roasted. Nux vomica, from the very small quantity of strychnia it contains, is not very active; but the susceptibility of its action, by different individuals, is various, and therefore it should always be given at first in small doses, as five grains; but fifty have been given without effect. The watery extract is also very feeble, and has the inconvenience of being deliquescent. From one to five grains may be given every three hours in dysentery, as recommended by Hufeland. The alcoholic extract is the best form, and may be given in the form of pills, containing one grain each. The common dose is two grains, repeated several times a-day; but sometimes 24 or even 30 grains are given before the tetanic shocks, which are always first perceived in the palsied parts, are produced. I have seen them when the patient took six grains daily, or nineteen in all. Strychnia itself is more active. It may be given in pills, containing one-twelfth or one-eighth of a grain. I have commonly used half a grain in each pill, and the tetanic spasms were induced after three such pills, or 1½ grs. were taken daily.

Off. Prep.—Extractum nucis vomicæ, *D.*

STYRAX.

Willd. *g.* 874; Spr. *g.* 1539. *Decandria Monogynia.*—Nat. ord. *Bicornes*, Linn., *Diospyreæ*, Juss.

Sp. 1. STYRAX OFFICINALE. *Ed. Lond. Dub.*

Off.—The balsam, called Storax *.

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* *Syn.* Στυραξ, (*Dios.*) Storax, (*Fr.*) Styrax, (*Ger.*) Storace, (*It.*) Usteruk, (*Arab.*)

BALSAMUM STYRACIS OFFICINALIS. *Ed.* BALSAMUM STYRACIS. *Lond.* Resina. *Dub.*

THIS tree grows in the Levant, Italy, and France. The storax flows from wounds made in the bark, in countries where the heat is sufficient; for neither in France nor in Italy does it furnish any. Storax occurs in three forms. The best kind, *St. in granis*, is in grains, either distinct or slightly agglutinated, of a yellowish or reddish-yellow colour, about the size of a pea, as soft as wax, tough, and having the smell of the finest vanille. It is probably the product of spontaneous exudation, and is not now to be procured. The second kind is in masses, *(St. in massis,)* of a clear brown or reddish colour, less translucent, resinous, pieces agglutinated by a clammy substance. This is also rare, and now occurs in bladders. Formerly it was sent packed in the leaves of a reed, and hence called *Styrax calamita* or *canuliculata.* It likewise has an agreeable smell like balsam of Peru, an aromatic balsamic taste, and is inflammable. The third kind, which almost alone occurs in commerce, and is sold as *St. calamita,* is common storax, *St. vulgaris, Scobs styracis.* It is totally different from the preceding. It consists of large, light, compressed, clear brown, round or shapeless masses, which externally are not unlike peat turf, easily friable. It is evidently a compound of saw-dust and other foreign substances with genuine storax, or is the residuum of black Peruvian balsam after decoction. When good, it should, by pressure between two hot plates, yield a fluid brown resin, smelling like storax.

Storax has an agreeable smell and an aromatic taste. Neumann got from 480 grains, 360 alcoholic, and 30 of watery extract; and inversely, 120 watery, and 240 alcoholic. In distillation it yielded benzoic acid. It is therefore a balsam, or natural combination of resin with benzoic acid.

Med. use.—It is employed for perfuming wax lights, or for fumigations.

Off. Prep.—Tinctura benzoes comp. *D. L. E.* Pil. e styrace, *D.*

Sp. 3; Spr. *sp.* 4. STYRAX BENZOIN. *Ed. Lond. Dub.*

Off.—The balsam, called Benzoin *.

BALSAMUM STYRACIS BENZOINI, *vulgo* Benzoinum. *Ed.* BENZOINUM; balsamum. *Lond.* Resina. *Dub.*

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* *Syn.* Asa dulcis, (*Off.*) Benzoin, (*Fr.*) Benzoeharz, Süsser Asant, (*Ger.*) Benjoia, (*It.*) Malacca sambranie, (*Tam.*) Loobanie ood, (*Duk.*) Looban, (*Hind.*) Cominyan, (*Malay,*) Sambranie, (*Tel.*) Devadhoopa, (*Sans.*) Liban, (*Arab.*) Caloowell, (*Cyng.*) Menian, (*Jav.*) Manian Kaminian, (*Palambang*).

This species grows in Sumatra, and furnishes the balsam on being wounded. It occurs in large masses, on which the impression of the reed mats is visible. It is quite dry, and, easily pulverizable, of a brownish-red colour, spotted with clear red, and in proportion to its fineness has intermixed a larger number of tears, *(Benzoë amygdaloides,)* resembling in size and form almonds, with an even fracture having a greasy lustre, and translucent, while the mass is opaque, uneven in its fracture, and occasionally porous. Its taste is sweetish, balsamic and resinous; its smell, especially when rubbed or kindled, pleasant and balsamic; sp. gr. 1.068. The large masses, quite opaque, of a brownish or blackish colour, and destitute of white grains, is called Benzoin in sorts, *Benzoë in sortis.*

Benzoin when thrown on hot coals burns, and emits a thick, white, strong smelling, suffocating smoke, exciting cough. It consists of benzoic acid. Neumann found that benzoin was totally soluble in alcohol, forming a blood-red tincture, and that water extracted no gummy matter, but a notable proportion of benzoic acid. Lime and the alkaline carbonates dissolve the acid without attacking the resin, and are accordingly employed in the process of Scheele, Gottling, and Gren, for obtaining the benzoic acid. I find that the solution of potass dissolves benzoin very rapidly, forming a dark coloured solution, mixed with fine crystals of benzoat of potass. This alkaline solution is not decomposed by water, but forms with acids a rose-coloured coagulum, easily soluble in excess of acid. Boiling nitrous acid also attacks benzoin with great violence, and dissolves it entirely; the solution becomes turbid, and lets fall a copious precipitate on cooling, which, according to Mr Brande, is benzoic acid. It is also decomposed by water, and by alkaline solutions. Benzoin is converted by digestion with nitric or sulphuric acid into artificial tannine. It has been analyzed by various chemists; and Stolze compared the results obtained from 1000 parts of the tears, and of the connecting medium separately.

	Tears.	Medium.
Yellow resin soluble in pure ether,	798.25	88.00
Brown resin insoluble in pure ether,	2.50	697.25
Benzoic acid,	198.00	197.00
Extractive,	none	1.50
Impurities,	none	14.50
Moisture and loss,	1.25	1.75

They therefore contain nearly an equal quantity of the valuable constituent, the benzoic acid. The chief difference consists in the resin. This has the property of giving a green colour to permuriate of iron. 100 parts of good benzoin should neutralize from 24 to 26 parts of subcarbonate of soda.

Med. use.—It is supposed to be pectoral, and the precipitated tincture is used as a cosmetic.

Off. Prep.—Acidum benzoicum, *L. E. D.* Tinct. benzoini comp. *L. E. D.*

SUBACETAS CUPRI. *Ed.* See CUPRUM.

SUBBORAS SODÆ. *Ed.* See SODA.

SUBCARBONAS POTASSÆ IMPURUS. *Ed.* See POTASSA.

SUBCARBONAS SODÆ IMPURUS. *Ed.* See SODA.

SUCCINUM. *Ed. Lond. Dub.*

Amber *.

AMBER, sparingly found in other countries, is chiefly procured from Prussia, especially on the shores of the Baltic, either under the sea, or in the alluvial coast. From the latter, it is dug up as a mineral; and from the former, it is either dragged up by nets, or is thrown ashore by storms, entangled in sea-weed. It is generally encrusted with iron pyrites, and always occurs in the vicinity of fossile wood. The largest piece ever found weighs 13½ pounds. It is generally considered to be of vegetable origin, which was Pliny's opinion.

Amber is hard, brittle, with a conchoidal fracture, of a smooth shining surface, commonly semitransparent, or only translucent, or almost opaque; colour pale citron-yellow, or dark-yellow, or reddish-brown, or of several of these in stripes or veins; sp. gr. 1.065 to 1.07; taste scarcely any; smell, none spontaneous, but when rubbed, or thrown on hot coals, peculiar, aromatic, and not unpleasant. By friction it becomes negatively electric; and when heated it softens, swells, and then melts, and burns with a greenish or bluish flame, leaving resinous matter, (*Colophonium succini,*) soluble in alcohol and the oils, and used for varnishes; insoluble in water and in alcohol, but the latter extracts a little succinic acid, and acquires an orange colour. Nitric acid first converts it into a light resinous substance, and then dissolves it; sulphuric acid forms with it a black resinous mass, containing much artificial tannine. Weak alkaline ley dissolves it, and the solution is miscible with alcohol and with water. Volatile and fixed oils have little action upon it, but it is softened by boiling in linseed oil. By destructive distillation it yields of olefiant gas, 1.40; succinic acid, 4.65; acetic acid, 1.15; fluid oil, 16.50; viscid oil, 24.00; concrete oil, 7.50; carbonaceous residuum, 39.50; loss, 2.50 = 100. According to Berzelius, amber consists of a volatile oil, two resins soluble in alcohol and ether, succinic acid, and an insoluble bituminous substance, insoluble in all solvents, and which is its principal ingredient.

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* *Syn.* Εληκτρον, (*Diosc.*) Electrum, Ambra flava, (*Off.*) Succin, (*Fr.*) Bernstein, (*Ger.*) Succino, (*It.*) Umbri, (*Tam. Tel.*) Karooba, (*Duk. Pers.*) Kepoor, (*Hind.*) Ambar, (*Malay.*) Kernalbehr, (*Arab.*) Ambra, (*Cyn.*) Hambar, (*Bali.*)

For pharmaceutic use, only the smaller pieces, and raspings or turnings are used, which are liable to be adulterated with colophony. The fraud is discovered by the smell emitted on throwing a portion on hot coals.

Off. Prep.—Oleum succini, *D. L. E.* Acidum succini, *D. E.*

Sulphas barytæ. *Ed.* See Baryta.

Sulphas cupri. *Ed.* See Cuprum.

Sulphas magnesiæ. *Ed.* See Magnesia.

Sulphas potassæ. *Ed.* See Potassa.

Sulphas sodæ. *Ed.* See Soda.

a) Sulphur. *Lond.* [*].
Roll Sulphur. Cane brimstone.
b) Sulphur sublimatum. *Lond. Ed. Dub.*
Sublimed sulphur [†].

Sulphur is a crystallizable solid, of a yellow colour; little sensible taste; peculiar smell when rubbed or heated; specific gravity 1.99; brittle; electric; fusible at 216°; burning with a pale blue flame at 300°; and with a bright white flame at 600°; and capable of combining with different proportions of oxygen. It is found in the vicinity of volcanoes, and exists in many minerals, and in some animal and vegetable substances.

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[*] *Syn.* Θεῖον, (*Diosc.*) Soufre en canon, (*Fr.*) Stansgenschwefel, (*Ger.*) Zolfo in canna, (*It.*) Gendagum, (*Tam.*) Ghendagum, (*Tel.*) Gunduck, (*Duk.*) Kabrit, (*Arab.*) Gowgird, (*Pers.*) Gundbuc, (*Hindooie.*) Blerong, (*Mal.*) Gundaka, (*Cyng.*) Gandhaka, (*Sans.*) Gunduk, (*Mali.*) Lew, (*Chin.*)

[†] *Syn.* Soufre sublimé, (*Fr.*) Schwefelblumen, (*Ger.*) Zolfo sublimato, (*It.*)

In the neighbourhood of volcanoes it is sometimes found perfectly pure and crystallized; but all the sulphur of commerce is extracted from pyrites by sublimation. It is usually brought to us in large irregular masses, which are afterwards melted and cast into cylindrical rolls. Sulphur should be chosen of a bright yellow colour, should be very inflammable, burn with a bright pure blue flame, and leave no residuum. When contaminated with arsenic or selenium, it is of a redder colour.

Sublimed sulphur is never prepared by the apothecary. It has the form of a very fine crystalline powder, having a beautiful yellow colour. It is often contaminated with a little sulphuric acid formed during the process, from which it is easily freed by washing.

Med. use.—Sulphur stimulates the system, loosens the belly, and promotes the insensible perspiration: it seems to pervade the whole habit, and manifestly transpires through the pores of the skin, as appears from the sulphureous smell of persons who have taken it, and from silver in their pockets being stained of a blackish colour. In the stomach it probably becomes combined with hydrogen.

It is a common remedy against cutaneous diseases, both given internally, and applied externally. Against scabies, it is specific. It has likewise been recommended in rheumatic pains, flying gout, rickets, atropha, coughs, asthmas, and other disorders of the breast and lungs, and particularly in catarrhs of the chronic kind. In hæmorrhoidal affections it is very frequently given; but in most of these cases it is advantageously combined with some cooling purgative, especially supertartrate of potass.

Off. Prep. of roll sulphur.—Ferri sulphuretum, *D.*

——— *of sublimed sulphur.*—Sulphur lotum, *L. E. D.* Sulphur præcipitatum, *L.* Oleum sulphuratum, *L. E.* Unguentum sulphuris, *L. E. D.* Ungt. sulph. comp. *L.* Potassæ sulphuretum, *L. E. D.* Hydrargyri sulphuretum nigrum, *L. E. D.* Hyd. sulph. rubrum, *D. L.* Sulphuretum ferri, *E.*

SULPHURETUM ANTIMONII. *Ed.* See ANTIMONIUM.

SULPHURETUM HYDRARGYRI RUBRUM. *Ed.* See HYDRARGYRUS.

SUPERTARTRAS POTASSÆ IMPURUS. *Ed.* SUPERTARTRAS POTASSÆ. *Ed.* See POTASSA.

TABACI FOLIA. *Lond.* See NICOTIANA.

TAMARINDUS INDICA. *Ed. Dub. Lond.*

Willd. *g.* 1250, *sp.* 1; Spr. *g.* 2479, *sp.* 1. *Monadelphia Triandria.*—Nat. ord. *Lomentaceæ,* Linn., *Leguminosæ,* sect. *Cassieæ,* Juss.

Tamarind tree *.

Off.—The preserved fruit.

PULPA; leguminis pulpa. *Lond.* LEGUMINIS PULPA. *Dub.* FRUCTUS. Fructus conditus. *Ed.*

THIS tree grows both in the East and West Indies. The fruit is a broad ash-coloured pod, divided by a tough membraneous endocarp into several distinct cells, each containing one hard brown seed. The epicarp is thin; and the acid pulp, for which they are esteemed, is the sarcocarp. East India tamarinds are longer than those from the West Indies; the former containing six or seven seeds each, the latter rarely above three or four. De Candolle is doubtful whether they be the same species, but Hayne thinks they are.

The preserved tamarinds sent from the East Indies are the best, but rarely to be got. They are called in this country black tamarinds, and are the fruit freed from their epicarp and pressed into a mass. They have a marron-brown colour, a vinous smell, and a pleasant vinous sour taste. In the West Indies they are preserved in two ways: commonly by throwing hot sugar from the boilers on the ripe pulp: but a better method is to put alternate layers of tamarinds and powdered sugar into a stone jar. By this means the tamarinds preserve their colour, and taste more agreeably.

Preserved tamarinds should be fresh and juicy, and should have an agreeable acid taste. They should not have a musty smell; the seeds should not be soft and swollen; and the blade of a knife should not get a coating of copper by being immersed among them.

Tamarinds were analyzed by Vauquelin. They contain sugar, jelly, mucilage, citric acid, supertartrate of potass, tartaric acid, and malic acid.

Med. use.—The pulp of these fruits, taken in the quantity of from two or three drachms to an ounce or more, proves gently laxative and purgative, and, at the same time, by its acidity, quenches thirst, and allays immoderate heat. It increases the action of the sweet purgatives, cassia and manna, and weakens that of the resinous cathartics.

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* *Syn.* Tamarinier, (*Fr.*) Tamarindenbaum, (*Ger.*) Tamarindo, (*It.*) Poolie, (*Tam.*) Umblie, (*Arab. Hind. Duk.*) Mahasi-ambala, (*Cyn.*) Neghka, (*Mal.*) Tamiri hindee, (*Pers.*) Umblu, (*Hindooie,*) Amlika, Tintili, (*Sans.*) Tintiri, (*Hind.*) Chinta punddo, (*Tel.*) Kamal, (*Jav.*) Tamalaki, (*Band.*) Cay-me, (*Cochin-Chin.*) Balam pulli, (*Rheede.*) Tetul, (*Hind.*) Champahu, (*Sunda.*)

Neutral salts, whose base is potass, form an improper addition to tamarinds; for they are decomposed, and the tartaric acid of the fruit is precipitated with the potass in the form of supertartrate of potass.

Off. Prep.—Infusum sennæ cum tamarindis, *D. E.* Electuarium sennæ, *D. E. L.* Electuarium cassiæ, *D. E.*

TANACETUM VULGARE. *Dub. Ed.*

Willd. *g.* 1472, *sp.* 18; Spr. *g.* 2728, *sp.* 11; Smith, *g.* 360, *sp.* 1. *Syngenesia Polygamia superflua.*—Nat. ord. *Compositæ discoideæ*, Linn., *Synantheræ*, sect. *Corymbiferæ*, Juss.

Common tansy *.

Off.—The leaves and flowers.

a) FOLIA. *Dub. Ed.*

b) FLORES. *Ed.*

TANSY is an indigenous herb with a perennial root. It is not uncommon on the borders of fields, and by road sides, and is frequently cultivated in gardens, both for culinary and medicinal purposes. Its stem is from 1–3 feet high, erect, and slightly branched. Its leaves are bipinatifid, inciso-serrate. They should be gathered in July. The flowers are yellow, in a terminal corymb; discoid, florets of the ray very few, ligulate, tridentate. It flowers in July and August. The seeds are a longish 5–6 ribbed akene.

The whole plant is very bitter and aromatic. The leaves, flowers and seeds have been very minutely analyzed by Frommherz, and the two former by Perschier. The active principles were volatile oil and bitter extractive, especially the latter, as the seeds, which are the most powerfully anthelmintic of all, contain much bitter principle, and little volatile oil.

The volatile oil, according to Geoffroy, is green when the herb grows in a moist soil, and yellow on a dry soil; but Frommherz, in a moderately dry summer, got it always yellow.

Med. use.—From the sensible properties and chemical analysis, tansy must be considered as an aromatic bitter, and useful in all diseases to which such medicines are appropriate. Its several parts have also had peculiar virtues assigned to them. The seeds have considerable reputation as anthelmintics, used in the same manner as the *Semen santonici.* Some physicians have had a great opinion of it in hysteric disorders, particularly those proceeding from a deficiency or suppression of the uterine purgation. An infusion of tansy drunk as tea has been strongly recommended as a preventive of the return of gout.

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* *Syn.* Tanasie, Herbe aux vers, (*Fr.*) Rainfarrn, Gemeiner Wurmkraut, (*Ger.*) Tanaceto, (*It.*)

TARAXACI RADIX. *Lond.* See LEONTODON.

TARTARUM. *Lond.* TARTARI CRYSTALLI. *Dub.* See POTASSA.

TEREBINTHINA CHIA. *Lond. Dub.* See PISTACIA.

TEREBINTHINA CANADENSIS. *Lond.* TEREB. VENETA. *Dub.* TEREB. VULGARIS. *Lond.* TEREBINTH. OLEUM. *Lond.* See PINUS.

TIGLII OLEUM. *Lond.* See CROTON.

TOLUIFERA BALSAMUM. *Ed. Dub.* See MYROXYLON.

TORMENTILLA ERECTA. *Ed.* Willd. TORMENTILLA OFFICINALIS. *Lond. Dub.* Smith.

Willd. *g.* 1001, *sp.* 1; Smith, *g.* 236, *sp.* 1. *Potentilla Tormentilla.* Spr. *g.* 1864, *sp.* 69. *Icosandria Polygynia.*—Nat. ord. *Senticosæ,* Linn., *Rosaceæ,* sect. *Fragariæ,* Juss.

Septfoil. Common tormentil *.

Off.—The root.

RADIX. *Ed. Lond. Dub.*

TORMENTIL is an indigenous perennial herb, very frequent in woods and on commons. The root, *rhizoma,* is cylindrical, at the upper part about the thickness of the finger, above two inches long, tuberculated, hard, beset with numerous radicles, covered with a red brown epidermis; bark dark purple, compact; wood and pith slightly red, with a very astringent taste, and a slightly aromatic smell. It should be gathered in spring.

The root has long been known as a powerful astringent, and is employed by the Laplanders for staining leather red. It has been analyzed by Meissner, who found in it, tannine, 174; a red colouring matter soluble in alcohol, pretty soluble in ether, and not at all in water, 180.5; the same modified, 25.75; gummy extractive, 43.25, gum, 282; extractive extracted by caustic alkali, 77; myricine, 2; cerine, 5.25; resin, 4.25; volatile oil, a trace; fibres, 150; moisture, 64.25 = 1008.

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* *Syn.* Tormentille, (*Fr.*) Tormentille, Aufrechte Ruhrwurzel, (*Ger.*) Tormentilla, (*It.*)

Med. use.—It is one of the most agreeable and efficacious of the indigenous astringents, and may be employed with good effect in all cases where medicines of this class are proper. It may be given in powder, decoction or extract. The last would be a good indigenous substitute for catechu.

TOXICODENDRI FOLIA. *Lond.* See RHUS.

TRAGACANTHA. *Lond. Dub.* See ASTRAGALUS.

TRITICUM HYBERNUM. *Ed. Lond. Dub.*

Willd. *g.* 152, *sp.* 2; *Tritricum vulgare.* Spr. *g.* 328, *sp.* 4; *Triandria Monogynia.*—Nat. ord. *Gramina*, Linn., Juss.

Winter wheat *.

Off.—Flour, starch.

a) FARINA; e seminibus †. *Lond.* SEMINUM FARINA. *Dub.*
b) AMYLUM. *Ed. Lond.* See AMYLUM.

THE native country of wheat, as well as of the other *cerealia*, is uncertain. Fabulous history has named Sicily, but India is more probable. Wheat is an annual grass, of which the varieties have become numerous by cultivation.

The seeds are yellowish or reddish, oval, gibbous, obtuse at both ends, about two lines long, smooth, convex on the back, marked with a cicatrix towards the apex, and with a longitudinal furrow, with oval margins below, and the base tomentose. 100 seeds of good wheat weigh about 68.5 grs.

By grinding and sifting the seeds are separated into various products. The *bran* or bruised pericarp amounts to from 25 to 33 *per cent.*, according to the variety of wheat. The flour is white, heavy, and slightly yellowish. By analysis it is separated into starch, 74.5; gluten, 12.5; gummy sugar, 12; and yellow resin, 1 = 100; but the proportions of these vary very much in different wheats. The most nutritious contain most gluten. Vauquelin employed analysis to ascertain the relative value of different kinds of wheat, for the use of the Hospitals of Paris.

It is the presence and abundance of gluten which distinguishes the flour of wheat from that of the other grains;

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* *Syn.* Froment, Blé, (*Fr.*) Weizen, (*Ger.*) Formento, Grano, (*It.*) Godhumer, (*Sans.*) Gom, (*Ben.*) Gioon, (*Hind.*) Gundum, (*Pers.*) Bir, (*Arab.*)

† *Syn.* Farine, (*Fr.*) Weizenmehl, (*Ger.*) Farina di formento, (*It.*) Godumbay-mao, (*Tam.*) Trinjoo pittay, (*Cyn.*) Geunka ata, (*Duk.*) Godoma-pindie, (*Tel.*) Godhuma-pishta, (*Sans.*)

and on the due admixture of it with the other constituents depends the superiority of wheat flour for baking bread.

Bread is made by working the flour into paste with water, a quantity of some ferment, such as yeast, and a little muriate of soda to render it sapid, allowing the paste to stand until a certain degree of fermentation take place, and then baking it in an oven, heated to about 488°. During the fermentation, a quantity of gas is formed; and as it is prevented from escaping by the toughness of the paste, and dilated by the heat of the oven, the bread is rendered light and spongy. In this process, the nature of the constituents of the flour is altered, for we are not able to obtain either gluten or starch from bread.

Med. use.—Bread is not only one of the most important articles of nourishment, but is also employed in pharmacy for making cataplasms, and the crumb (*mica panis*) is used in making pill masses, to give form to more active articles. An infusion of toasted bread has a deep colour and pleasant taste, and is an excellent drink in febrile diseases, and debility of the stomach. Flour is sprinkled upon the surface in erythematic inflammations of the skin. Its utility is doubtful. It may prevent irritation from friction, where oily applications would be improper; but it is hurtful where there is any exudation, which forms with it a hard crust.

Off. Prep.—Cataplasma fermenti cerevisiæ, *D.*

TUSSILAGO FARFARA. *Ed. Lond. Dub.*

Willd. *g.* 1483, *sp.* 12; Spr. *g.* 1723, *sp.* 4; Smith, *g.* 360, *sp.* 1. *Syngenesia superflua.*—Nat. ord. *Compositæ radiatæ*, Linn., *Synantheræ*, sect. *Corymbiferæ*, Juss.

Colts-foot *.

Off.—The herb and flowers.

a) FOLIA. *Ed. Dub.* TUSSILAGO. *Lond.*
b) FLORES. *Ed. Dub.*

THIS herb, with a perennial root, grows wild in moist situations, producing yellow flowers in March and April, which are soon succeeded by large roundish leaves, hairy underneath; their taste is herbaceous, somewhat glutinous and subacrid.

Med. use.—Colts-foot is recommended in coughs, phthisis, and other disorders of the breast and lungs, and some use it in scrofula. Its effects probably depend more on the milk in which it is commonly directed to be taken, than on the herb itself.

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* *Syn.* Tussilage, Pas d'ane, (*Fr.*) Gemeiner Huflattich, (*Ger.*) Tussilagine, (*It.*)

ULMUS CAMPESTRIS. *Ed. Lond. Dub.*

Willd. *g.* 505, *sp.* 1; Spr. *g.* 1099, *sp.* 1; Smith, *g.* 117, *sp.* 1. *Pentandria Digynia.*—Nat. ord. *Scabridæ*, Linn., *Ulmaceæ*, Juss.

Common elm *.

Off.—The inner bark.

CORTEX. Cortex interior. *Ed.* CORTEX. Liber. *Lond.* CORTEX INTERIOR. *Dub.*

THIS tree is indigenous in Britain. It flowers in April. The inner bark has a brownish-yellow colour, and a mucilaginous, bitter, astringent taste, without smell; is thin and tough. Water distilled from the bark has the smell of bitter almonds. It also contains much gummy and mucilaginous matter, and some muriate of soda, oxalate of lime, and very little resin. From the bark of the elm there sometimes exudes a juice, which concretes into a peculiar substance, called *Ulmine.*

Med. use.—In decoction elm bark has been highly recommended in the lepra ichthyosis, and has been said to cure dropsies.

Off. Prep.—Decoctum ulmi, *L. D.*

VALERIANA OFFICINALIS. *Ed. Dub.* (Sylvestris). *Lond.*

Willd. *g.* 75, *sp.* 6; Spr. *g.* 139, *sp.* 50; Smith, *g.* 15, *sp.* 3. *Triandria Monogynia.*—Nat. ord. *Aggregatæ*, Linn., *Valerianeæ*, Juss.

Wild valerian †.

Off.—The root.

RADIX. *Ed. Lond. Dub.*

THIS indigenous plant is perennial, and varies in its appearance and sensible qualities, according to the situation in which it grows. But Geiger thinks that there are two varieties, distinguished by the breadth of their leaves. The root should be collected early in spring, before the stem begins to shoot, and only in dry situations. It must be quickly dried.

The root *(rhizoma)* is short, tuberculated, sending out very numerous radicles, long, thin, half a line thick, contorted, with a blackish-brown epidermis, a thickish bark, as if soaked in oil, brown near the wood, which is whitish and very small; taste acrid, bitter; smell strong and subnauseous.

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* *Syn.* Orme champêtre, (*Fr.*) Weissrüster, Feldume, (*Ger.*) Olmo, (*It.*)

† *Syn.* Valeriane sauvage, (*Fr.*) Gemeiner Baldrian, (*Ger.*) Valeriana selvatica, (*It.*)

The English valerian, whose radicles are smaller and shorter, and which has a stronger smell, is preferred, according to the Prussian Pharmacopœia. In Germany it is said to be mixed with other roots. Prof. Hoppe got in a parcel of 30 lbs., only three of genuine valerian. The rest consisted of roots of species of *ranunculus*.

The expressed juice and dried root were analyzed by Trommsdorff. From the latter he got nearly, starch, 16; resinous extractive, 128; gummy extractive, 82; resin, 54; volatile oil, 11; and woody fibre, 709 = 1000.

The volatile oil is the active constituent. It is fluid, of a pale greenish colour, of a pungent odour, and an aromatic taste. It grows yellow and viscous by exposure to the air, forms with nitric acid an orange-yellow resin, having a strong odour, and specific gravity 0.934.

Med. use.—Wild valerian root is a medicine of great use in nervous disorders, proceeding from a debility of the nervous system. It is used to procure sleep, particularly in fever, when opium fails or disagrees; but it is principally useful in affections of the hysterical kind.

The common dose is from a scruple to a drachm in powder; and in infusion, from one to two drachms. Its unpleasant flavour is most effectually concealed by adding some mace.

As its virtues reside chiefly in the volatile oil, it should not be exhibited in decoction or watery extract.

Off. Prep.—Infusum valerianæ, *D.* Tinctura valerianæ, *D. L.* Tinct. val. ammoniata, *D. L. E.*

VERATRUM ALBUM. *Ed. Lond. Dub.*

Willd. *g.* 1859, *sp.* 1. *Polygamia Monœcia.* Spr. *Hexandria Trigynia*, *g.* 1379, *sp.* 2.—Nat. ord. *Liliaceæ*, Linn., *Colchicaceæ*, Juss.

White hellebore *.

Off.—The root.

RADIX VERATRI ALBI. *Ed.* RADIX VERATRI. *Lond.* RADIX HELLEBORI ALBI. *Dub.*

THIS plant grows spontaneously in Switzerland and the mountainous parts of Germany. The root is fusiform, an inch or more in length, scarcely the thickness of the finger; sending out from tubercles numerous long round radicles; having a pale brownish-yellow epidermis; whitish bark, and a yellowish-grey parenchyme, spotted with carnation, especially in the centre; that of the fibrils whiter, and more spongy; smell when recent nauseous; taste corresponding, at first sweetish, then very acrid, durable and burning; powder greyish.

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* *Syn.* Héllébore blanc, Varaire, (*Fr.*) Weisser Germer, Weisse Niesswurzel, (*Ger.*) Elleboro bianco, (*It.*)

It has been analyzed by Pelletier and Caventou. It contains a greasy substance, consisting of elaine, stearine, and a volatile acid, supergallate of veratria, yellow colouring principle, starch, lignine, gum, salts of lime and potass, and silica. On being wounded, hellebore emits an extremely acrimonious juice, which, when inserted into a wound, produces very violent effects. *Veratria*, its narcotic principle, has been described in the observations on the *colchicum autumnale*, in which it also occurs. This explains satisfactorily the similarity of the effects of these two substances.

Med. use.—The powder of the dried root, applied to an ulcerated surface, occasions violent purging; snuffed up the nose, it proves a strong, and not always a safe, sternutatory. Taken internally, it acts with extreme violence as an emetic, and has been observed, even in a small dose, to occasion convulsions, and even death. The ancients sometimes employed it in obstinate cases, but always made it their last resource. According to the very ingenious analysis of Mr Moore, a vinous infusion of white hellebore, with the addition of one-fourth part of laudanum, forms the *Eau Medicinale d'Husson*, so much celebrated as a specific in gout. Mr Moore put his mixture to the test of experiment. He administered it in some cases of gout. "In these four cases, the effects of the mixed infusions were precisely the same with equal doses of the eau medicinale. In two of the cases, where two drams were given, vomiting and purging were produced; and in one case, the medicine occasioned constipation, which happens also with the *eau medicinale*; and the gout in all was relieved."

Off. Prep.—Unguentum veratri, *L. D.* Decoctum veratri, *D.*

VERBASCUM THAPSUS. *Dub.*

Willd. *g.* 376, *sp.* 1; Spr. *g.* 654, *sp.* 1; Smith, *g.* 97, *sp.* 1. *Pentandria Monogynia.*—Nat. ord. *Solaneæ.*

Great Mullein.

FOLIA. *Dub.*

THE mullein is indigenous, biennial, and varies in height from two to six feet. The root is strong, woody, and fibrous. The stalk straight, erect, simple, round, and winged by the decurrent leaf-stalks. The leaves are slightly notched, somewhat wrinkled, woolly on both sides, especially the lower. The lower leaves, from six inches to a foot long, lancet shaped, or oblong lanceolate. Flowerspike from six inches to a foot long, cylindrical, dense. Flowers yellow. The leaves, when fresh, have a weak narcotic smell, and when dried not unpleasant; taste, when fresh, weak like raddishes, and bitterish, and when dry somewhat rancid and slimy.

Med. use.—They are chiefly employed as a slightly anodyne emollient, infused in hot water.

VINUM ALBUM HISPANUM. *Dub.* Anglice Sherry. *Ed.*
Sherry [*].

WINE is the juice of the grape altered by fermentation. The numerous varieties of wine depend principally on the proportion of sugar contained in the must, and the manner of its fermentation. When the proportion of sugar is sufficient, and the fermentation complete, the wine is perfect and generous: if the quantity of sugar be too large, part of it remains undecomposed, and the wine is sweet and luscious: if, on the contrary, it be too small, the wine is thin and weak; and if it be bottled before the fermentation be completed, it will proceed slowly in the bottle, and on drawing the cork, the wine will sparkle in the glass, as, for example, Champagne. When the must is separated from the husk of the grape before it is fermented, the wine has little or no colour: these are called White wines. If, on the contrary, the husks are allowed to remain in the must while the fermentation is going on, the alcohol dissolves the colouring matter of the husks, and the wine is coloured: such are called Red wines. Besides in these principal circumstances, wines vary much in flavour.

Excellent treatises on wine have been lately published by Julien in France, and by Mr Morewood and Dr Henderson in our own country.

The following tables exhibit a comparative view of the contents of different wines and spiritous liquors. The first is taken from Mr Brande; the second is from Neumann; the third from Julia Fontenelle; and their remarkable differences in regard to some wines show how much they vary, or how little such experiments can be depended upon. The numbers indicate the quantity of alcohol of sp. gr. 0.825 in 100 parts of the wine.

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[*] *Syn.* Οινος, (*Dios.*) Vin, (*Fr.*) Wein, (*Ger.*) Vino, (*It.*) Shirab unghorrie, (*Duk.*) Khumar, (*Arab.*) Drakh ka mud, (*Hind.*) Mey, (*Pers.*) Mada, Madira, (*Sans.*)

	Strongest.	*Medium.*	*Weakest.*
Scotch whisky,		54.32	
Irish whisky,		53.90	
Rum,		53.68	
Brandy,		53.39	
Hollands,		51.60	
Lissa wine,	26.47	25.41	24.35
Raisin wine,	26.40	25.12	23.20
Marsala,	26.03	25.09	25.05
Madeira,	24.42	24.17	23.93
Port,	25.83	22.96	21.40
Currant wine,		20.55	
Cape Madeira,	22.94	20.51	18.11
Madeira, red,	22.30	20.35	18.40
——— sercial,	21.40	20.34	19.24
Teneriffe,		19.79	
Colares,		19.75	
Constantia, white,		19.75	
Lachryma Christi,		19.70	
Sherry,	19.83	19.17	18.25
Vidonia,		19.25	
Lisbon,		18.94	
Bucellas,		18.49	
Constantia, red,		18.92	
Calcavalla,	19.20	18.65	18.10
Cape muscat,		18.25	
Rousillon,	19.00	18.13	17.26
Grape wine,		18.11	
Malaga,	18.94	18.10	17.26
White hermitage,		17.43	
Alba flora,		17.26	
Zante,		17.05	
Malmsey Madeira,		16.40	
Sheruaz,		15.52	
Lunel,		15.52	
Syracuse,		15.28	
Claret,	17.11	15.10	12.91
Nice,		14.63	
Burgundy,	16.60	14.57	11.95
Sauterne,		14.22	
Barsac,		13.86	
Champagne, still,		13.30	
Vin de Grave,	13.94	13.37	12.80
Tent,		13.30	
Champagne sparkling,		12.80	
Frontignac rivesalte,		12.79	
Cote rotie,		12 32	
Red hermitage,		12.32	
Gooseberry wine,		11.84	
Hock,	14.37	12.08	8.88
Champagne, red,	12.56	11.93	11.30
Orange wine,		11.26	
Tokay,		9.88	
Elder wine,		8.79	
Cyder,	9.87	7.54	5.21
Perry,		7.26	
Ale, Burton,		8.88	
—— Edinburgh,		6.20	
—— Dorchester,		5.56	
—— average,		6.87	
Brown stout,		6.80	
London porter,		4.20	
Small beer,		1.28	

The first column in this Table shews the quantity of rectified spirit; the second that of thick, oily, unctuous, resinous matter; the third of gummy and tartareous matter; and the fourth of water in 17280 parts.

	I.	II.	III.	IV.
Malmsey,	1920	2100	1140	12120
Alicant,	1800	2900	100	12840?
Neufchatel,	1560	1920	900	12900
French,	1440	400	60	15380
Frontignac,	1440	1680	320	13830
Muscadine,	1440	1200	480	14160
Salamanca,	1440	1680	960	13200
Sherry,	1440	2880	1080	11880
Tinto,	1440	3120	840	11800
Hermitage,	1380	600	100	15200
Monte Pulciano,	1320	180	160	15620
Carcassone,	1320	250	80	15630
Champagne,	1280	400	60	15540
Canary,	1140	1200	2160	12780
Madeira,	1140	1560	960	13620
Moselle,	1080	260	90	15850
Rhenish,	1080	200	94	15906
Tokay,	1080	2100	2400	11700
Burgundy,	1080	240	100	15860
Old Rhenish,	960	480	140	15700
Pontac,	960	320	120	15880
White Brandenburgh,	960	420	180	14880?
Vin de grave,	960	360	120	15840
Red Brandenburgh,	840	280	120	16040
Aland,	840	1560	780	14100
Red Tyrol	720	600	240	15120
Spanish,	600	1200	4560	10920

Bamyulls,	21.96	Mèze,	18.60
Rivesaltes,	21.80	Bezieres,	18.40
Colliouvre,	21.62	Lunel,	18.10
Lapalme,	20.93	Montpellier,	17.65
Mirepeisset,	20.45	Carcassone,	17.22
Salces,	20.43	Frontignan,	16.90
Narbonne,	19.90	Bourgogne,	14.75
Lezignan,	19.46	Bordeaux,	14.73
Leucate di Fitou,	19.70	Champagne,	12.20
Montagnac,	19.30	Toulouse,	11.97
Nissan,	18.80		

Med. use.—Wine, taken in moderate quantities, acts as a beneficial stimulus to the whole system. It promotes digestion, increases the action of the heart and arteries, raises the heat of the body, and exhilarates the spirits. Taken to excess, it produces inebriety, which is often succeeded by headach, stupor, nausea, and diarrhœa, which last for several days. Habitual excess in wine debilitates the stomach, produces diseases of the liver, weakens the nervous system, and gives rise to dropsy, gout, apoplexy, tremors, and cutaneous affections.

To convalescents, and in all diseases of general debility, and deficiency of the vital powers, wine is the remedy on which we must place our chief dependence. It is contraindicated in all inflammatory complaints, and when it sours upon the stomach.

Off. Prep.—Vinum aloes, *D. E.* Vin. gentianæ comp. *E.* Vin. ipecacuanhæ, *D. E.* Vin. nicotianæ tabaci, *E.* Vin. opii, *D. E.* Vin. rhei, *E.* Vin. tartratis antimonii, *E.*

UVA URSI. *Lond. Dub.* See ARBUTUS.

UVÆ PASSÆ. *Lond.* See VITIS.

VIOLA ODORATA. *Ed. Dub.*

Willd. *g.* 446, *sp.* 12; Spr. *g.* 894, *sp.* 7; Smith, *g.* 96, *sp.* 2. *Pentandria Monogynia.*—Nat. ord. *Campanaceæ,* Linn., *Violariæ,* Juss.

Sweet-smelling violet *.

Off.—The recent flower.

FLORES. *Ed. Dub.*

THIS plant is perennial, and is found wild under hedges and in shady places; but the shops are generally supplied from gardens. It flowers in March and April. Its flowers are so remarkable for their odour and colour, that they have given a name to both. The single and cultivated variety is preferable, and the flowers ought to be gathered when scarcely blown. They enter into the syrup of violets, which serves as a reagent. According to Hayne it is quite impossible for an apothecary in a large city to collect a sufficient quantity of the flowers of the March violet to supply the demand for the syrup of violets; and hence they are obliged to substitute the flowers of the *Aquilegia vulgaris* and *Viola tricolor grandiflora* to give the colour, and orris root for the smell. Litmus ought on no account to be employed, as it is not changed to green by alkalies, and therefore does not serve the purpose of a chemical test. The roots of all the violets act as emetics, and some are used as substitutes for ipecacuan, and by analysis they contain the same principle, *Emetine.* M. Boullay has discovered *violine*, which exists in all the parts of the plant. It is alkaline; forms salts by its union with acids, is scarcely soluble in water, but is soluble in alcohol.

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* *Syn.* Violette de mars, Violier commun, (*Fr.*) Wohlriechender Veilchen, Märzviole, (*Ger.*) Viola marzia, Viola mamola, (*It.*)

Med. use.—The herb of the *Viola odorata* was one of the five emollient herbs of the ancients, and the flowers one of the four cordial flowers. The flowers impart their colour and flavour to aqueous liquors: a syrup made from the infusion has long had a place in the shops, and is said to be an agreeable and useful laxative for children, but it is chiefly valued as a delicate test of the presence of uncombined acids or alkalies, the former changing its blue to red, and the latter to green. The seeds of the March violet were used as a diuretic, and even against gravel; and it is said that they expelled a number of small calculi from the Emperor Maximilian.

Off. Prep.—Syrupus violæ, *D. E.*

VITIS VINIFERA. *Ed. Dub. Lond.*

Willd. *g.* 453, *sp.* 1; Spr. *g.* 848, *sp.* 9. *Pentandria Monogynia.*—Nat. ord. *Hederaceæ*, Linn., *Viniferæ*, Juss.

Off.—Sun-raisins *.

FRUCTUS. Fructus siccatus. *Ed.* FRUCTUS SICCATUS. *Dub.* UVÆ PASSÆ; baccæ præparatæ. *Lond.*

THE vine grows in temperate situations in many parts of the world, and is cultivated very generally for the sake of its agreeable subacid fruit. Before they are ripe, grapes are extremely harsh and acid, and by expression furnish a liquor which is called Verjuice. It contains malic acid, super-tartrate of potass, and extractive, and may be made to furnish wine by the addition of sugar. As the grape advances to maturity, the quantity of sugar in it increases, while that of malic acid diminishes: it however never disappears entirely.

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* *Syn.* Raisins de caisse, Raisins secs, (*Fr.*) Grosse Rosinen, (*Fr.*) Zibibbi, (*It.*)

Med. use.—When thoroughly ripe, the grape is one of the most agreeable fruits. It is cooling, antiseptic and nutritious, and when eaten in considerable quantity, diuretic, and gently laxative. In inflammatory diseases, and all others where acids are indicated, grapes form an excellent article of diet.

Raisins are grapes which have been carefully dried. By this means not only the water they contained is dissipated, but the quantity of acid seems to be diminished. They become more saccharine, mucilaginous, and laxative, than the recent grape, but are less cooling.

Off. Prep.—Decoctum althææ, *D. E.* Decoct. guaiaci comp. *E.* Decoct. hordei comp. *D. L.* Tinctura cardamomi comp. *L.* Tinct. sennæ, *L.*

WINTERA AROMATICA. *Ed.* Willd. *g.* 1063.

DRYMIS WINTERI. *Dub.* Spr. *g.* 204, *sp.* 1. *Polyandria Tetragynia.*—Nat. ord. *Oleraceæ*, Linn., *Magnoliaceæ*, Juss.

Off.—Winter's bark.

CORTEX. *Ed. Dub.*

THIS was first discovered on the coast of Magellan by Captain Winter. The sailors then employed the bark as a spice, and it was afterwards found serviceable in the scurvy, for which purpose it is at present also sometimes made use of in diet drink. Canella alba is often substituted for it. The Winter's bark is in large pieces, of a more cinnamon colour than the canella, and much warmer and more pungent, but less aromatic and bitter. Its smell resembles that of cascarilla. Its virtues reside in a very hot, stimulant, volatile oil. M. Henry found in it resin, volatile oil, tannine, a colouring matter, and some salts. Canella contains no tannine.

Med. use.—Martius esteems it as the best spice which Brazil produces.

ZINCUM. *Ed. Dub. Lond.*

Zinc.

ZINC is bluish-white, lamellated, sapid, and odorous; specific gravity, 7.190; soft, clogging the file; above 212° malleable and ductile; fusible at 700°; vaporizable; a powerful agent in the phenomena of galvanism; oxidized by fusion; at a red heat it catches fire, and emits white films of oxide; it easily decomposes water; it is oxidized and dissolved by almost all the acids.

It is always found oxidized: 1. Combined with a greater or less proportion of carbonic acid; calamine. 2. Combined with sulphur; blende. 3. Combined with sulphuric acid, generally in solution. The ores of zinc are rarely worked by themselves, or with the sole intention of extracting zinc, but are generally melted with the lead ores, particularly galena, which they commonly accompany. By this process the zinc is obtained in two forms; part of it is sublimed in the state of an oxide, and attaches itself to the chimney of the furnace, in the form of a grey, granular, earthy-like incrustation, which is known by the name of Tutty or Cadmia; and part of it is sublimed in its metallic form, and is condensed in the throat of the chimney, in small grains, which are afterwards melted in a crucible, and cast into ingots.

Off. Prep.—Zinci oxidum, *D. E.* Zinci sulphas, *D. L. E.*

OXIDUM ZINCI IMPURUM. *Ed.* Impure oxide of zinc. Tutty.

IT is moderately hard and ponderous; of a brownish colour, and full of small protuberances on the outside, smooth and yellowish within; some pieces have a bluish cast, from minute globules of zinc in its metallic form.

Med. use.—Tutty is celebrated as an ophthalmic, and frequently employed as such in unguents and collyria, and as an exsiccant in the *Intertrigo* of infants.

Off. Prep.—Unguent. oxidi zinci impuri, *E.* Oxidum zinci imp. præparat. *E.*

CARBONAS ZINCI IMPURUS, V. S. Lapis calaminaris. *Ed.* ZINCI CARBONAS IMPURUM: CALAMINA. *Dub.* CALAMINA, s. s. Carbonas zinci impura. *Lond.*

Impure carbonate of zinc. Calamine.

THIS mineral is found plentifully in England, Germany, and other countries, either in distinct mines, or intermingled with the ores of different metals. It is usually of a greyish, brownish, yellowish, or pale reddish colour, without lustre or transparency; fracture commonly uneven or earthy; considerably hard. Before the blowpipe it decrepitates, but does not melt, and becomes yellower, and is sublimed. It is partly soluble in acids, and often effervesces with them.

Mr Smithson has analyzed several varieties of calamine. England and Carinthia furnish the best. Its specific gravity is 4.33, and it contains 65 *per cent.* of oxide of zinc, while the calamine from Hungary and Fribourg has a specific gravity of 3.5, and contains from 25 to 50 *per cent.* of quartz.

Calamine is generally roasted before it comes into the shops, to render it more easily reducible into a fine powder.

Med. use.—In the state of impalpable powder it is employed in collyria, against defluxions of thin acrid humours from the eye-lids, for drying up moist running ulcers, and healing excoriations.

Off. Prep.—Zinci carbonas impurum præparatum, *D. E.* Calamina præparata, *E.*

ZINGIBER. *Lond. Dub.* See AMOMUM.

PART III.

PREPARATIONS AND COMPOSITIONS.

CHAP. I.—SULPHUR.

SULPHUR SUBLIMATUM LOTUM. *Edin.*
Washed Sublimed Sulphur *.

Take of Sublimed sulphur, one part;
Water, four parts.

Boil the sulphur for a little in the water, then pour off this water, and wash away all the acid by affusions of cold water; and, lastly, dry the sulphur.

SULPHUR LOTUM. *Lond.*
Washed Sulphur.

Take of Sublimed sulphur, a pound.

Pour on it boiling water, so that the acid, if there be any, may be entirely washed away; then dry the sulphur.

Dub.

Let warm water be poured upon sublimed sulphur, and the washing be repeated as long as the water, when poured off, is impregnated with acid, which is known by the test of litmus. Dry the sulphur on bibulous paper.

As it is impossible to sublime sulphur in vessels perfectly void of air, a small portion of it is always acidified and converted into sulphurous or sulphuric acid. The presence of acid in sulphur is an impurity, which may be detected by litmus, and must be removed by careful ablution. Unwashed sulphur, kept in an open drawer, at last becomes manifestly acid on the surface; but when thoroughly washed, sublimed sulphur is not acted upon by the atmosphere.

Off. Prep.—Potassæ sulphureti aqua, *D.*

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* *Syn.* Sulphur depuratum.

SULPHUR PRÆCIPITATUM. *Lond.*
Precipitated Sulphur *.

Take of Sublimed sulphur, one pound;
Fresh lime, two pounds;
Water, four gallons.

Boil the sulphur and lime together in the water, then filter the liquor through paper, and drop into it as much muriatic acid as may be necessary to precipitate the sulphur. Lastly, wash this by repeatedly pouring upon it water till it becomes insipid.

By boiling lime and sulphur together in water, water is decomposed: and, without the evolution of any gas, sulphuric acid and sulphuretted hydrogen are formed. These unite with the lime, forming sulphate of lime and hydro-sulphuret of lime; but the latter dissolves an additional proportion of sulphur, forming sulphuretted hydro-sulphuret of lime, or what might be called hydro-bisulphuret of lime, which is the solution obtained by filtration in the first part of the process. This is of a golden yellow colour: and as it is very rapidly decomposed by contact with air, it is to be immediately decomposed by muriatic acid, which unites with the lime, expels the sulphuretted hydrogen, and precipitates the additional sulphur, which is easily purified by ablution from the very soluble muriate of lime. The directions are, however, incomplete. Henry and Guibourt order, that after exposing the mixture for a day or two to the open air, the fluid is to be decanted, the precipitate to be washed with much water, or laid upon filtering paper, spread upon linen, and dried. Notwithstanding this long exposure, it however has always a smell of sulphuretted hydrogen.

This process, at least on a small scale, often fails, and, instead of the light white powder, we obtain the sulphur partly or entirely in the state of a viscid yellow and very fetid paste, called *Stink-resin* by the Germans. In experiments which I made, it seemed to arise from adding the acid too quickly and in excess. The quantity of lime used in forming the hydro-sulphuret, though reduced in the edition 1815 from three pounds to two, is still somewhat too large. Mr Phillips found that 10 parts of sulphur require only about 4.5 of lime. According to the atomic doctrine, 16 of sulphur with 28 of lime form the sulphuret, and the deuto-sulphuret would contain 32 of sulphur, of which the second proportion only is precipitated. In the *Pharm. Raison.* 15 parts of lime are used to 36 of sulphur, and boiled with 150 of water: the solution has sp. gr. 1.165, and, according to its authors, contains in solution 7571 of per-sulphuret of lime, and 2519 hypo-sulphate of lime.

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* Hydratum sulphuris, Lac sulphuris, Magisterium sulphuris.

Precipitated sulphur occurs in cakes of a very loose and light substance, without taste or smell, of a yellowish-white verging into greyish-white; totally insoluble in water, soluble in boiling solution of caustic potass, and easily fusible; totally vaporizable by heat. It is liable to many adulterations from sulphuric acid, or solution of alum, or of sulphate of magnesia being used instead of muriatic acid to precipitate the sulphur, which increase the product by the admixture of sulphate of lime, alumina, or magnesia. These adulterations may be suspected when the mass is of a brilliant white colour, and are detected by not being totally vaporizable by a red heat.

Precipitated sulphur, though much more expensive, possesses no advantage over well-washed sublimed sulphur, unless its whiter colour be considered as an advantage in the preparation of ointments.

SULPHURETUM POTASSÆ. *Edin.*

Sulphuret of Potass *.

Take of Subcarbonate of potassa, two parts;
Sublimed sulphur, one part.

Triturate them together; put them into a large coated crucible, fit a cover to it, and having applied live coals cautiously round it, bring the mixture at length to a state of fusion. Keep the mass in a very close phial.

Lond.

Take of Washed sulphur, one ounce;
Subcarbonate of potass, two ounces.

Triturate them together, and place them in a covered crucible over the fire until they unite.

Dub.

Take of Carbonate of potass four parts;
Sublimed sulphur, one part.

Mix and put them into a crucible. Fit a cover to it, and expose them to a heat, gradually increased, until they unite. Keep the sulphuret in a well-closed phial.

IN this process a sulphuret of potassium is formed. The exact mode of decomposition has not been ascertained; and it perhaps varies according to the proportions used and the heat applied. Great part of the potassa loses its oxygen, which combines with part of the sulphur, and forms an acid which unites with the undecomposed potassa: the potassium formed unites with another portion of the sulphur, and the whole carbonic acid and water are expelled. But part of the sulphur is volatilized without change, and is apt to inflame. By calculation 16 parts of sulphur should decompose 66 of salt of tartar, or 48 of potassa, to form a proto-sulphuret. 36 parts of the potassa furnish 6 of oxygen to combine with 4 of the sulphur, forming 10 of sulphuric acid, which combine with the 12 undecomposed potassa, and form 22 sulphate of potassa. The 30 potassium thus liberated join with 12 of the sulphur and form 42 proto-sulphuret of potassium. If with the same quantity of salt of tartar, 32 of sulphur be employed, a bi-sulphuret should be formed. The product of the operation is in all cases a mixture of sulphate of potass with sulphuret of potassium.

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* *Syn.* Hepar sulphuris, Sulphuretum lixiviæ, Hydrosulphuretum potassæ, Kali sulphuratum, Sulphuratum kalicum, Sulphuretum kali.

The Colleges use carbonate of potass prepared from pearl ashes; but it always contains iron, and the sulphuret formed, when dissolved in water for a bath, discolours the skin. In their preceding edition, the Dublin College used equal parts of the ingredients: they now use four of the alkaline salt to one of sulphur. The proportion used by London and Edinburgh agree with those prescribed by Henry as the best. He directs two parts of salt of tartar to be used with one of roll sulphur reduced to powder; to fill two-thirds of a matrass with it; to place it in a sand bath; to apply the heat gradually, and raise it until the mixture is melted, and remain in tranquil fusion. The product is a bisulphuret of a fine yellow colour, and entirely soluble in water.

There is another method of preparing sulphuret of potassium, by decomposing sulphate of potass by charcoal. Hermbstädt heats together in a crucible four parts of sulphate of potass with one of charcoal powder. The charcoal is converted into carbonic oxide or acid gas, and the sulphate into sulphuret. The proportions here agree very nearly with calculation; 24 of carbon should decompose 88 of sulphate of potass; there should be formed 56 carbonic oxide, and 56 sulphuret of potassium.

Sulphuret of potass is of a liver-brown colour, and was hence formerly called *Hepar sulphuris.* It should be hard, brittle, and have a vitreous fracture. It has an acrid bitter taste, and the smell of sulphur. It is exceedingly prone to decomposition. It is deliquescent in the air, and is decomposed. It is very fusible, but a strong heat expels the excess of sulphur above the proto-sulphuret. The moment it comes in contact with water there is a mutual decomposition. The oxygen of the water combines with the potassium to form potassa, and the hydrogen with the sulphur to form sulphuretted hydrogen : the result is hydro-sulphuret of potass, which, on most occasions, is united with an additional proportion of sulphur, forming a hydro-bisulphuret. By acids, sulphuret of potassium is immediately decomposed ; the acid combines with potassa, sulphuretted hydrogen gas is expelled, and the additional sulphur is precipitated.

For some purposes, such as the obtaining a precipitated sulphur, or sulphureous baths and lotions, the larger the quantity of sulphur combined with the potassium the better ; but for obtaining sulphuretted hydrogen as for a test, the proto-sulphuret is preferable.

Med. use.—The therapeutical action of sulphuret of potass may still be considered as doubtful. It is only certain, that it produces the specific effects of sulphur, as in curing scabies, and in saturating the system with sulphur. But while its apparent general effects are stimulant, some contend that it diminishes the action of the heart, and acts as a sedative. Empirically it is employed, both externally and internally. It is dissolved in water, and employed as a lotion, with almost constant success, in scabies ; and in more dilute solutions, it is used as a general sulphureous bath. Soon after Bonaparte proposed Croup as the subject of a prize essay, the sulphuret of potass acquired great reputation as a specific against that formidable disease. It was given in doses of 1–4 grains to infants, and from 5–10 to adults, repeated every three or four hours, either in pills with extract of liquorice, or in solution with syrup. But Albers and Royer Collard disapproved of its indiscriminate employment. By Dr Garnet it was recommended in *phthisis pulmonalis* as a disoxygenizing remedy. It has also been used in chronic and atonic rheumatism and gout. A solution in volatile oil of juniper has got in France the name of *Elixir antigoutteux.* In salivation and mercurial symptoms generally, as well as in struma, it is not unfrequently prescribed, but I cannot say with much success.

POTASSÆ SULPHURETI AQUA. *Dub.* *.
Water of Sulphuret of Potass.

Take of Washed sulphur, one part ;
Water of caustic potass, eleven parts.

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* *Syn.* Solutio kali sulphurati, Hydrothionas potassæ.

Boil for ten minutes, and strain through paper. Keep the liquor in phials well corked. The specific gravity of this liquor should be 1117.

THIS preparation is exactly similar to a solution of sulphuret of potassium in water. When sulphur is boiled in a solution of caustic alkali, a portion of the water is decomposed; the oxygen unites with one portion of sulphur to form sulphuric acid, and the hydrogen with another portion to form sulphuretted hydrogen, both of which combine with the potassa. The solution must be well preserved from the action of the air, which gradually decomposes it, and converts the whole into sulphate of potass.

SULPHURETUM FERRI. *Ed.* *.

Sulphate of Iron.

Take of Purified filings of iron, three parts;
Sublimed sulphur, one part.

Mix and expose them to a moderate degree of heat, in a covered crucible, until they unite into a mass.

Dub.

Heat with an intense fire, in a blast furnace, iron-rods to a white heat, and immediately apply them to a roll of sulphur. Receive the sulphuret of iron in water; separate it from the sulphur; dry it, and keep it in close vessels.

THE sulphuret of iron is only used in pharmacy for the preparation of hydro-sulphuret of ammonia. Proust proved that iron is capable of combining with two proportions of sulphur. At a high temperature, 28 parts of iron combine with 16 of sulphur, and form a compound of a dull blackish colour. In this state, it is fit for the production of sulphuretted hydrogen gas. At a lower temperature, the same quantity of iron takes up 32 of sulphur, forming a bi-sulphuret, acquires a greenish-yellow colour, and in every respect resembles native pyrites. This cannot be decomposed by acids, and is therefore unfit for the production of gas; but it may be reduced to the state of iron sulphuretted to the minimum, by exposing it to a sufficiently high temperature, or by melting it with half its weight of iron-filings. Of the two processes, that of the Dublin College furnishes the purest product; but it is less easy. Unless the bar of iron be heated to a white heat, it only melts the sulphur, and does not combine with it. When the process is successful a shower of sparks is thrown off. It also requires caution to prevent the hands from being burnt. A smith's forge answers well for heating the iron.

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* *Syn.* Hepar sulphuris martiale, Ferrum sulphuratum.

The process of the other colleges is easier, but the product is less pure, and may contain either some bisulphuret or metallic iron. No sulphuretted hydrogen can be procured from the former, and from the latter it is mixed with hydrogen gas. It may be performed in a Florence flask large enough to hold three times the quantity of materials, and heated in a common chauffer. At a certain temperature the whole mass acquires a bright cherry red, during which the combination takes place, and the heat may be withdrawn. The flask may be loosely stopped with a notched cork or a roll of paper. Lemery directed the mixture to be tempered with water before introducing it into the flask.

Off. Prep.—Ammoniæ hydrosulphuretum, *D. E.* Potassæ hydriodas, *D.*

HYDRO-SULPHURETUM AMMONIÆ. *Ed.*
Hydro-Sulphuret of Ammonia *.

Take of Water of ammonia,
Sulphuret of iron, of each four ounces;
Muriatic acid, eight ounces;
Water, two pounds and a half.

Pour the acid, previously mixed with the water, upon the sulphuret, and pass the gas extricated from them through the water of ammonia. Keep the liquor in very close phials.

Dub.

Take of Sulphuret of iron in coarse powder, five parts;
Sulphuric acid, seven parts;
Water, thirty-two parts;
Water of caustic ammonia, four parts.

Put the sulphuret into a retort, then gradually pour on the acid previously diluted with water, and in a proper apparatus transmit the gas evolved, through the water of ammonia. Towards the end of the operation apply a gentle heat to the retort.

SULPHURETTED hydrogen is capable of combining with different bases in the manner of an acid; and indeed it is now admitted that oxygen is not the only acidifying principle, but that hydrogen and other elements possess the same property. It has therefore been proposed to call the substance now in question *Hydro-sulphuric acid;* but as the same term has been unfortunately applied to sulphuric acid containing water, the unambiguous term *Hydrothionic acid* is preferable. In the present preparation, sulphuretted hydrogen is combined with ammonia. For this purpose, it is obtained by decomposing sulphuret of iron by a dilute acid. The water is decomposed, the oxygen unites with the iron to form protoxide, and the hydrogen with the sulphur to form hydrothionic acid; the muriatic acid combines with the protoxide, and the hydrothionic acid is expelled as a gas. The combination of this gas with ammonia is facilitated by reduction of temperature, and by making it pass through a column of the water of ammonia, by means of an apparatus, such as Woulfe's. The ammonia very readily assumes a greenish-yellow colour, and an extremely fetid smell, from the absorption of the sulphuretted hydrogen. It should give coloured precipitates with neutral metallic solutions, and should effervesce, and deposite sulphur copiously on the addition of an acid. Dr Barker discovered, that if the ammonia be not neutralized, it renders turbid the solution of neutral salts of magnesia.

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* *Syn.* Liquor ammonii sulphurati, Sulfuretum hydrogenatum ammoniæ, Hydrosulfas ammoniæ sulfuratus, Sulphuretum ammoniæ, Spiritus salis ammoniaci sulphuratus, Liquor ammoniæ sulphurato-hydriothionici.

When ammoniacal and hydrothionic gases are mixed in proper proportion, beautiful crystals are precipitated in the air, like flakes of snow.

Med. use.—Hydro-sulphuret of ammonia acts powerfully on the living system. It induces vertigo, drowsiness, nausea, and vomiting, and lessens the action of the heart and arteries. It therefore seems to be a direct sedative. According to the doctrine of the chemical physiologists, it is a powerful disoxygenising remedy. It has been used only in diabetes, by Dr Rollo and others, under the name of Hepatized ammonia, in doses of five or ten drops twice or thrice a-day.

CHAP. II.—ACIDS.

ACIDUM SULPHURICUM PURUM. *Dub.*

Pure Sulphuric Acid[*].

Take of Commercial sulphuric acid, one pound.

Put it into a retort of white glass, to which there is adapted, without lute, a receiver of the same kind. Heat the retort until a twelfth part come over, which is to be rejected as too watery. Replace the receiver and distil to dryness. The ebullition, which might otherwise be too violent, may be moderated by putting into the retort a few slips of platinum. The specific gravity is 1845. Keep the acid in very close vessels.

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[*] *Syn.* Acidum sulphuricum rectificatum, seu depuratum.

Commercial sulphuric acid is always contaminated with a little sulphate of lead and sulphate of potass, in consequence of its mode of preparation. It also frequently contains a little sulphurous acid, and more than the due proportion of water. To render it pure, and to bring it to the requisite degree of concentration, the process, now first made officinal by the Dublin College, is employed. In the first twelfth obtained, and which is kept separate, the excessive water and the sulphurous acid, if any be present, are separated, and the fixed impurities remain in the retort. This process requires some dexterity in the manipulation, chiefly on account of the low capacity for heat of sulphuric acid vapour. The retort should be of excellent quality, and have the bottom extremely thin. It should not be above half filled. The danger from the succussion of the boiling acid is in a great measure avoided by the introduction of the slips of platinum foil, which cause the bubbles to rise in a continued stream. The temperature requisite is about 620° F., and the whole body of the retort must be heated to this degree, by immersing it well in the sand-pot. No lute can be applied. The receiver is often cracked by the heat of the condensed acid. To avoid this, if possible, the neck of the retort, or extremity of the adopter, if one be used, should reach into the middle of the receiver, which should be kept warm by covering it with flannel, or by immersing it in hot water. But the most certain way of avoiding all these inconveniences is to use vessels of platinum.

Sulphuric acid, thus purified, is colourless, transparent, very heavy, and has an oily consistence. It is distinguished from commercial acid by leaving no residuum when heated in a platinum crucible, nor letting fall any precipitate when mixed with rectified spirit.

Off. Prep.—Acidum sulphuricum dilutum, *D.* Hydrargyri persulphas, *D.* Zinci sulphas, *D.* Potassæ hydriodas, *D.* Acidum sulphuricum aromaticum, *D.*

ACIDUM SULPHURICUM DILUTUM. *Ed.*
Diluted Sulphuric Acid [*].

Take of Sulphuric acid, one part;
Water, seven parts.
Mix them.

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[*] Acidum vitrioli tenue, Spiritus vitrioli.

Dub.

Take of Sulphuric acid, one part;
Pure distilled water, seven parts.
Add the acid gradually to the water. The specific gravity of this acid is 1084.

Lond.

Take of Sulphuric acid, one fluidounce and a half;
Distilled water, fourteen fluidounces and a half.
Add the acid by degrees to the water, and mix.

THE most simple form in which sulphuric acid can be advantageously employed internally, is that in which it is merely diluted with water: and it is proper that there should be some fixed standard, in which the acid in this state should be kept in the shops. In the London Pharmacopœia before 1817, one part by weight of oil of vitriol was mixed with nine of water, which gave a mixture containing in 100 parts about 11.11 of dry acid: in the subsequent editions one and a half by measure is mixed with 14 and a half of water, which furnishes a mixture containing about 15.33 of dry acid. According to Mr Phillips, 100 grains of the London dilute acid saturate 50, and a fluidrachm 31 grains of the crystallized subcarbonate of soda. In the Edinburgh and Dublin Pharmacopœias, the strong acid is an eighth of the mixture, giving exactly one drachm in the ounce, which has at least the merit of convenience in pharmaceutic calculation. The quantity of dry acid contained in this mixture is about 12.5, which is intermediate between the dilute acids of the old and new editions of the London. The dilution by means of distilled water is preferable to spring water, which even in its purest state is not free from impregnations affecting the acid. Even when distilled water is used, there is with commercial acid a small quantity of a white precipitate, arising from lead dissolved in the strong acid.

Sulphuric acid has a very strong attraction for water; and their bulk, when combined, is less than that of the water and acid separately. At the same time, there is a very considerable increase of temperature produced, which is apt to crack glass vessels, unless the combination be very cautiously made; and for the same reason, the acid must be poured into the water, not the water into the acid. The greatest heat is evolved, and the greatest condensation takes place, according to Dr Ure, by mixing 73 parts of oil of vitriol with 27 of water. It is better, however, to pour in the whole acid in one continued stream, and to mix it with the water by gradual agitation, than to add the acid gradually.

Table of the Quantity of Liquid and Dry Sulphuric Acid in 100 *parts of Dilute, by Dr Ure, from actual experiment.*

Liquid.	Dry.	Sp. Gr.	Liquid.	Dry.	Sp. Gr.
100	—81.63	1.8460	40	—32.61	1.2499
95	77.55	1.8340	35	23.54	1.2572
90	73.47	1.8070	30	24.46	1.2184
85	69.39	1.7640	25	20.38	1.1792
80	65.30	1.7080	20	16.31	1.1410
75	61.22	1.6500	19	15.49	1.1330
73	59.52	1.6321	16	13.05	1.1090
70	57.08	1.5975	15	12.23	1.1019
65	53.00	1.5390	14	11.41	1.0953
60	48.92	1.4860	13	10.60	1.0887
55	44.85	1.4360	10	8.15	1.0682
50	40.77	1.3884	8	6.52	1.0544
45	36.69	1.3440	5	4.08	1.0336

Med. use.—Diluted sulphuric acid is an excellent tonic, exciting appetite, promoting digestion, quenching thirst, and checking fermentation in the stomach, and it is therefore used with success in morbid acidity, weakness, and relaxation of the stomach. As an astringent, it is used in hæmorrhagies; and from its refrigerant and antiseptic properties, it is a valuable medicine, in many febrile diseases, especially those called putrid. If taken in any considerable quantity, or for some time, it seems to pass off undecomposed by the kidneys or skin; and it is perhaps by its stimulant action on the latter, that it is advantageously employed internally in scabies, and other cutaneous affections.

Externally it is used as a gargle, particularly in putrid sore throats, and in aphthous mouths, and as a wash in cutaneous eruptions and ill-conditioned ulcers. Made into an ointment with sixteen times its weight of axunge, it has been used to cure psora.

Off. Prep.—Acidum benzoicum, *E.* Acidum citricum, *D. L.* Sulphur antimoniatum fuscum, *D. E. L.* Infusum rosæ acidum, *D. E. L.* Quininæ sulphas, *D.*

ACIDUM NITROSUM. *Ed.*

*Nitrous Acid**.

Take of Nitrate of potass, bruised, two pounds;
Sulphuric acid, sixteen ounces.

Having put the nitrate of potass into a glass retort, pour upon it the sulphuric acid, and distil in a sand-bath with a heat gradually increased, until the iron pot begins to be red-hot. The specific gravity of this acid is to that of distilled water as 1520 to 1000.

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* *Syn.* Acidum nitrosum concentratum, Acidum nitri fumans, Spiritus nitri fumans, Acidum nitrosum fumans, Acidum nitrosum liquidum, Acidum nitrico-nitrosum.

ACIDUM NITRICUM. *Ed.*
*Nitric Acid**.

Take of Nitrous acid, any quantity.

Put it into a glass retort, and having adapted a cold receiver, apply a very gentle heat, until the reddest portion shall have passed over, and the acid which remains in the retort, when almost deprived of colour, shall have become nitric acid.

Dub.

Take of Nitrate of potass, one hundred parts;
Commercial Sulphuric acid, ninety-seven parts.

Mix in a glass retort, and distil into a receiver connected with a pneumatic apparatus, until the residuum be again liquefied after having concreted. The sp. gr. is 1490.

Lond.

Take of Nitrate of potass, dried,
Sulphuric acid, each two pounds by weight.

Mix in a glass retort, and by means of a sand-bath distil off the nitric acid until red fumes appear. Then redistil the acid in the same manner, having previously added another ounce of dried nitrate of potass. The specific gravity of nitric acid is 1500 to 1000. 212 grains of subcarbonate of soda are saturated by 100 grains of this acid.

NITRE is an anhydrous salt, and consists of potass 48, combined with nitric acid 54=102. Potass has a greater affinity for sulphuric than for nitric acid, especially when heat is applied: sulphate of potass is formed, which remains fixed, and the nitric acid is evolved in the form of vapour, which afterwards condenses as it cools. Part of the nitric acid, however, is at the same time decomposed. The first portion of vapour which comes over is generally red, and when condensed smokes; afterwards the chief part of the product may be obtained pale or colourless; towards the end it again becomes red and smoking, and oxygen gas is at the same time evolved.

The object of the chemist is to get the product of the purest quality, and in largest quantity, with the least expense of materials, and sometimes of the greatest strength. It is therefore necessary to avoid every source of contamination; to employ the quantity of sulphuric acid which is necessary to decompose the nitre advantageously, and to prevent as much as possible the decomposition of the nitric acid separated.

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* *Syn.* Acidum nitricum concentratum, Spiritus nitri acidus.

The decomposition is generally effected in a glass retort: manufacturers use green glass. Into this the nitre coarsely powdered is first introduced, and the acid is then poured upon it; in doing which, means must be taken to prevent it from soiling the neck of the retort. When a common receiver is used, an adopter should be interposed between them, which need not be luted with the neck of the retort, but must be accurately luted with the neck of the receiver with fat lute, or one of pipe clay, sand and cut tow. The receiver should be tubulated with a bent tube dipping into water. Instead of a common receiver, some modification of Woulfe's apparatus may be used with advantage. In preparing it in large quantities for the arts, some manufacturers use earthen or cast-iron retorts, very thick, with an earthen head and a series of condensers.

Very different proportions of the materials have been recommended. The London College before 1809 used 60 nitre with 29 sulphuric acid; and manufacturers still employ rough nitre with half its weight of oil of vitriol; the Dublin 100 nitre to 97 acid, and the Edinburgh the proportions of six to four. The advantages from the additional dose of the acid are the more perfect decomposition of the nitre, the increase of the product from the greater quantity of water furnished by the acid, and the greater solubility of the residuary salt, which can be dissolved out of the retort.

Mr Phillips censures the middle proportions ordered by the Edinburgh College, as being inconsistent with the atomic constitution of the materials. He contends, that one equivalent of strong sulphuric acid, 49, is sufficient to decompose one equivalent of nitrate of potass, 104; but that two equivalents of the acid, 98, are necessary for procuring the whole acid, 54, of the salt.

To explain this, it is necessary to understand that nitric acid cannot exist, even in the state of gas, without the presence of water, of which two proportionals, 18, are assumed to be necessary for the constitution of one of nitric acid by combination with its elements, 54. Now, one proportional of oil of vitriol contains only one of water 9, which is not capable of condensing more than one half of the elements of the nitric acid evolved, and hence two equivalents of the sulphuric acid become necessary. The manufacturers who use only one equivalent, put the additional water necessary into the receiver.

Dr Hope states, that he always gets, by the process of the Edinburgh College, 15 parts of a full orange red colour, and sp. gr. 1520, or even 1540, when the nitre has been previously well dried and the acid boiled; and that the prescribed proportion of sulphuric acid is necessary and sufficient to decompose the nitre, so as to obtain an acid of great strength and free from sulphuric acid.

In confirmation of the due proportions of sulphuric acid and nitre being ordered by the Edinburgh College, it may be added, that they are also those of the Parisian Pharmacopœia. The product is indeed greater, though not so concentrated, when, according to Döbereiner's advice, the sulphuric acid is diluted with one part of water to nine of acid immediately before its addition to the nitre.

The London College, intending that the product should be *nitric* acid, direct us to continue the process only until red fumes appear. Mr Stocker says, that by careful distillation the London proportions afford nine ounces of straw-coloured nitric acid, sp. gr. 15404: after which the fumes become deeper red, and the product darker, inclining to orange; but the total product is but slightly coloured, amounts to ten or eleven ounces, and has the required sp. gr. 1520. We are indebted to Dr Barker for a comparative statement of the results of numerous experiments on the subject. He prefers equal proportions of the acid and salt, and he found that 100 parts of nitre yielded very nearly 67 parts of nitric acid, of *sp. gr.* 1500, or 70 of 1490, and 120.8 of bisulphate of potass. The acid was not contaminated with any sulphuric acid.

As obtained directly by any of these processes, the product is neither nitric nor nitrous acid, but a variable mixture of both. It is more or less high coloured, and emits red fumes; whereas pure nitric acid emits only white fumes. High coloured nitrous acid is easily procured of a greater specific gravity than the strongest nitric. The former has been obtained as high as 1.62 by Proust, while Dr Ure states 1.5 as the greatest strength of the latter; but the most conclusive authority is Meissner, who, in his elaborate work on Areometry, from his own experiments states the sp. gr. of the strongest perfectly colourless nitric acid to be 1.48, and of nitrous acid 1.63. It would appear, that when less than a certain proportion of water is present, the elements of nitric acid have a tendency to separate, and hence it cannot exist above 1.5, except in the state of a high coloured and fuming acid. Dr Barker also found, that when one equivalent of sulphuric acid only was employed, a considerable quantity of oxygen gas was disengaged, and that this decomposition did not take place when two equivalents of acid were used.

Theoretically two proportionals of nitric acid with one of nitric oxide are equivalent to three of nitrous acid. By the application of a gentle heat, the whole of the nitric oxide is vaporized, and pure colourless nitric acid remains in the retort. Upon this principle the Edinburgh College have given a process for converting nitrous into nitric acid, which Dr Powell thinks uneconomical. The nitric oxide carries over with it a portion of the acid, and condenses with it in the receiver, in the form of a very high coloured nitrous acid. Mr Phillips put 150 parts of red nitrous acid, sp. gr. 1522, into a retort; and after the application of heat, 114 of pale nitric acid remained, of sp. gr. 1495; 27 parts of red nitrous acid, of sp. gr. 1598, distilled over, and there was a loss of nine parts.

Liquid nitric acid consists of (ideal) dry nitric acid combined with water, in the proportion nearly of one to two. It is liquid, colourless, and transparent. It is very corrosive, and tinges the skin of a yellow colour. It produces heat when mixed with water, and absorbs water from the atmosphere. Acid of 1.42 rises unaltered at 248° Fahrenheit. Below 1.4 it strengthens by being boiled, and above 1.45 it becomes weaker. It is decomposed by many substances. Light gradually decomposes it, evolving oxygen and nitrous acid gas. When highly concentrated, it sets fire to oils, to sulphuretted hydrogen gas, to iron-filings, and to zinc, bismuth and tin, when poured on them in a state of fusion. It oxygenizes all the metals, except gold, platinum, and titanium. It consists of five volumes of oxygen, and one of nitrogen. Its saline compounds are called Nitrates.

Liquid nitrous acid is of an orange or red colour, exceedingly volatile, and emitting red fumes of an intolerable and suffocating odour. By the addition of water, its colour is successively changed to blue, green and yellow.

Nitrous acid is frequently impure. The presence of sulphuric acid is detected by nitrate of barytes; but before applying this test, the acid must be diluted, as otherwise the salt itself is precipitated in consequence of the acid attracting the water in which it is dissolved. Sulphuric acid is easily got rid of by re-distilling the nitrous acid from a small quantity of nitrate of potass, and this rectification forms part of the London process; as, from the large proportion of sulphuric acid used by them, they seem to have anticipated this contamination, which however does not take place, not even, according to Mr Stocker and Dr Barker, when the distillation is continued, until the saline mass is brought into a state of fusion. The rectification is therefore unnecessary.

Muriatic acid is detected by the precipitate formed with nitrate of silver, and may be separated by dropping into the nitrous acid a solution of nitrate of silver, as long as it forms any precipitate, and drawing off the nitrous acid by distillation.

ACIDUM NITROSUM DILUTUM. *Ed.*

Diluted Nitrous Acid *.

Take of Nitrous acid,
Water, equal weights.
Mix them, taking care to avoid the noxious vapours.

ACIDUM NITRICUM DILUTUM. *Lond.*

Diluted Nitric Acid †.

Take of Nitric acid, one fluidounce;
Distilled water, nine fluidounces.
Mix.

Dub.

Take of Nitrous acid, three measures;
Distilled water, four measures.
Mix, avoiding the noxious fumes. The specific gravity is 1280.

NITROUS acid has a great affinity for water, and attracts it from the atmosphere. During their combination there is an increase of temperature, part of the nitric oxide is dissipated in the form of noxious vapours, and the colour changes successively from orange to green, and to blue, according as the proportion of water is increased. It is to be regretted that the strength of this preparation should have been so much altered by the London College from what it formerly was in their own Pharmacopœia, and still is in those of the other colleges.

The following table shews their comparative strength;

	Strong.	E. & D. dilute.	L. dilute.
Specific gravity,	150	128	108
Weight of floz in grains,	684	584	493
100 grains contain of strong acid,	100	47.6	14.3
— saturate grains of subcarbonate of soda,	212	108.5	30.3

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* *Syn.* Acidum nitrico-nitrosum dilutum, Aqua fortis.

† *Syn.* Acidum nitricum tenue.

Table of Diluted Nitric Acids, abridged from Dr Ure.

Sp. gr.	Liq. Acid in 100.	Dry Acid in 100.	Sp. gr.	Liq. Acid in 100.	Dry Acid in 100.
15000	100	79.700	12826	48	38.256
14880	95	75.715	12765	47	37.459
14730	90	71.730	12644	45	35.865
14570	85	67.745	12341	40	31.880
14385	80	68.760	12019	35	27.890
14189	75	59.775	11709	30	23.900
13978	70	55.790	11403	25	19.925
13732	65	51.805	11109	20	15.940
13477	60	47.820	10821	15	11.955
13376	58	46.226	10764	14	11.158
13216	55	43.835	10540	10	7.970
12947	50	39.850	10267	5	3.985

Med. use.—The use of nitric acid in medicine has been considerably extended of late. In the state of vapour it has been used to destroy contagion in gaols, hospitals, ships, and other places where the accumulation of animal effluvia is not easily avoided. The fumigating such places with the vapour of nitrous acid has certainly been attended with success; but that success has often been ascribed entirely to the ventilation employed at the same time. Ventilation may unquestionably be carried so far that the contagious miasmata may be diluted to such a degree that they shall not act on the body; but to us it appears no less certain, that these miasmata cannot come into contact with nitric acid or oxymuriatic acid vapour, without being entirely decomposed and completely destroyed. Fumigation is, besides, applicable in situations which do not admit of sufficient ventilation; and in all cases, the previous diffusion of acid vapours is an excellent check upon the indolence and inattention of servants and nurses, as by the smell we are enabled to judge whether they have been sufficiently attentive to the succeeding ventilation. Nitric acid vapour, also, is not deleterious to life, and may be diffused in the apartments of the sick without occasioning to them any material inconvenience. The means of diffusing it are easy. Half an ounce of powdered nitre is put into a saucer, which is placed in a pipkin of heated sand. On the nitre two drachms of sulphuric acid are then poured. The fumes of nitric acid immediately begin to rise. This quantity will fill with vapour a cube of ten feet; and by employing a sufficient number of pipkins, the fumes may be easily made to fill a ward of any extent. For introducing this practice, Dr Carmichael Smyth received from the British Parliament a reward of five thousand pounds.

The internal use of these acids has also been lately much extended. In febrile diseases, water acidulated with them forms one of the best antiphlogistic and antiseptic drinks we are acquainted with. Hoffman and Eberhard long ago employed it with very great success in malignant and petechial fevers; and in the low typhus, which frequently rages among the poor in the suburbs of Edinburgh, I have repeatedly given it with unequivocal advantage. In the liver complaint of the East Indies, and in syphilis, nitric acid has also been extolled as a valuable remedy by Dr Scott; and the evident benefit resulting from its use in these complaints has given rise to a theory, that mercury only acts by oxygenizing the system. It is certain that both the primary and secondary symptoms of syphilis have been removed during the use of these acids, and that the former symptoms have not returned, or been followed by any secondary symptoms. But Mr Pearson does not think it advisable to rely on the nitrous acid in the treatment of any one form of the lues venerea; at the same time, he by no means wishes to see it exploded as a medicine altogether useless in that disease. When an impaired state of the constitution renders the introduction of mercury into the system inconvenient, or evidently improper, the nitrous acid will be found, he thinks, capable of restraining the progress of the disease, while, at the same time, it will improve the health and strength of the patient. On some occasions, this acid may be given in conjunction with a mercurial course, and it will be found to support the tone of the stomach, to determine powerfully to the kidneys, and to counteract, in no inconsiderable degree, the effects of mercury on the mouth and fauces.

Nitrous acid has been applied externally as a vesicatory in desperate cases of East India cholera, to destroy morbid bone, and even to remove very thick scabs in porrigo. It has been also proposed to apply it as an escharotic to the wound made by the bite of a rabid animal; but Dr Barker thinks the propriety of the practice still doubtful, "for on its first application it may accelerate the absorption of the poison." The diluted acid has been applied as a stimulant to indolent ulcers.

Off. Prep. of the strong acid.—Acidum nitricum dilutum, *D. L. E.* Acidum nitro-muriaticum, *D.* Antimonii oxydum nitro-mur. *D.* Hydrargyri persulphas, *D.* Ungt. hydrargyri nitratis, *D. L. E.* Hydrargyri nitro-oxydum, *L.* Argenti nitras, *L.* Liquor ferri alkalini, *L.* Spiritus ætheris nitrosi, *L. E.* Ungt. acidi nitrici, *E. D.*

Off. Prep. of the dilute acid.—Argenti nitratis crystalli, *D.* Argenti nitras fusum, *D. E.* Bismuthi subnitras, *D.* Hydrargyri oxydum nitricum, *D. E.* Calomelas præcipitatum, *D. E.* Hydrargyri submurias ammoniatum, *D.* Hydrargyri acetas, *D. E.*

ACIDUM MURIATICUM. *Ed.*

Muriatic Acid *.

Take of Muriate of soda, previously heated to redness,
Sulphuric acid,
Water, of each two pounds.

Mix the acid with eight ounces of the water, and when the mixture has cooled, pour it on the muriate of soda in a glass retort. Then having fitted on a receiver containing the rest of the water, distil in a sand-bath with a gentle heat. In a short time lute the vessels together, and distil to dryness. The specific gravity of this muriatic acid is to that of distilled water as 1170 to 1000.

Lond.

Take of Dried muriate of soda, two pounds;
Sulphuric acid, *by weight*, twenty ounces;
Distilled water, a pint and a half.

First mix the acid with half a pint of the water in a glass-retort, and add to the mixture, after it has cooled, the muriate of soda. Pour the rest of the water into the receiver; then having fitted on the retort, distil the muriatic acid over into this water, with the heat of a sand-bath gradually increased until the retort become red. The specific gravity of this acid is to that of distilled water as 1160 to 1000. One hundred grains of this acid saturate 124 of crystallized subcarbonate of soda.

Dub.

Take of Muriate of soda dried, one hundred parts;
Commercial sulphuric acid, eighty-seven parts;
Water, one hundred and twenty parts.

Mix half the water with the acid, and after it has cooled, pour it upon the muriate of soda in a glass retort. Put the rest of the water into a receiver, which must be connected with the retort in such a manner that the gas shall not be absorbed. Then distil off the liquid until the residuum become dry. The sp. gr. is 1160.

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* *Syn.* Acidum muriaticum concentratum, Acidum hydrochloricum, Acidum salis depuratum, Spiritus salis communis acidus.

According to the old doctrine, sea salt consisted of muriatic acid and soda, and in this process the sulphuric acid merely dislodged the muriatic by its superior affinity to the soda. But the present doctrine considers sea salt as composed of chlorine and sodium, and explains the process by assuming that, by the strong affinity of the sulphuric acid to soda, water is decomposed; its oxygen uniting with the sodium to form soda, and its hydrogen with the chlorine to form muriatic acid.

Muriatic acid is a permanently elastic fluid *, the addition of the water is therefore absolutely necessary for its existence in a fluid form. A portion of the water is put into the receiver, for the purpose of absorbing the muriatic acid gas, which is first disengaged, and would otherwise be lost for want of water to condense it. It is indispensably necessary that the mixture of acid and water be allowed to cool before it be added to the salt; for the heat produced is so great, that it would not only endanger the breaking of the retort, but occasion considerable loss and inconvenience, by the sudden disengagement of muriatic acid gas. Dr Powell thinks it is an improvement to add the salt to the diluted acid, but it is less convenient.

The muriate of soda, which should be of the kind called Bay salt, is directed by the Edinburgh College to be heated to redness, before it be introduced into the retort, not to expel the water of crystallization as formerly stated, for it contains none, but because the product is less coloured. The London and Dublin Colleges use the salt merely dried, but it is not enough.

The charge should not occupy more than half the body of the retort; and if a common retort and receiver be employed for this distillation, they must not be luted perfectly close; for if any portion of the gas should not be absorbed by the water employed, it must be allowed to escape; but the process will be performed with greater economy, and perfect safety, in a Woulfe's, or some similar apparatus. The muriatic acid gas, on its condensation, gives out, according to

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* Hydrochloric or muriatic acid gas is transparent and colourless. It destroys life, and extinguishes flame. 100 cubic inches weigh about 38.8 grains; or its sp. gr. is 17.25, hydrogen gas being unity. According to Sir H. Davy, it consists of equal volumes of chlorine and hydrogen gas. It decomposes alcohol and oil, and destroys putrid exhalations. Water is capable of absorbing about an equal weight of the gas. Its specific gravity is then 1.21; the solution is generally of a pale yellow colour, is very volatile, and emits white fumes of a peculiar unpleasant odour.

Dr Powell, a considerable heat, so that it is necessary to keep the receiver cooled during the process.

The residuum in the retort consists principally of sulphate of soda, which may be purified by solution and crystallization; and to save the retort, Dr Powell directs it to be filled with boiling water, after the process is over, and it has cooled down to 212°.

According to the atomic theory, 83.7 of sulphuric acid should decompose 100 of dried muriate of soda; but Dr Barker found that 87 at least were required. Mr Phillips even thought, that when equal quantities were used, one-seventh of the salt escaped decomposition; but this is contradicted by Dr Barker's experiments, from which it appeared, that 100 parts of dried salt will, on an average, yield 155 parts of liquid muriatic acid, *sp. gr.* 1160, and that the greatest quantity was yielded when the sulphuric acid was in excess. Dr Hope also considers it as certain, that equal proportions of acid and salt gave a larger product of muriatic acid, in a shorter time, and at a less expense of fuel, than when less sulphuric acid was used.

Muriatic acid should be colourless; emit greyish fumes when exposed to the atmosphere, have a specific gravity of 1160, and should leave no residuum on evaporation. The presence of muriate of soda, added to increase its density, is detected by its acting upon gold leaf; and of sulphuric acid, by its becoming turbid with a solution of muriate of baryta. The sulphuric acid may be easily got rid of, by redistilling the acid from a small quantity of dried muriate of soda. But Mr Hume discovered, that muriate of baryta is precipitated when poured into pure muriatic acid, from the acid attracting the water of the salt. It is therefore necessary to dilute it before testing it.

Off. Prep.—Acid. muriaticum dilutum, *D.* Acid. benzoicum, *D.* Acidum nitro-muriaticum, *D.* Acid. prussicum, *D.* Barytæ murias, *D. E.* Solutio muriatis calcis, *E.* Antimonii oxydum nitro-muriaticum, *D.* Muriatis ferri liquor, *D. L. E.* Hydrosulphuretum ammoniæ, *E.*

ACIDUM MURIATICUM DILUTUM. *Dub.*
Diluted Muriatic Acid.

Take of Muriatic acid, ten measures.
Distilled water, eleven measures.
Mix. The specific gravity is 1080.

THIS diluted acid, of a fixed strength, is convenient for apportioning its dose; and as it is now introduced by the Dublin College, it is to be hoped that the same proportions will be adopted by the other colleges.

Table of the Quantity of Acid of 1.2; *of Muriatic Acid Gas; and of Chlorine, in* 100 *parts of Liquid Muriatic Acid of different densities, abridged from* Dr Ure.

Sp. Gr.	Liquid Acid.	Acid Gas.	Chlorine.	Sp. Gr.	Liquid Acid.	Acid Gas.	Chlorine.
1.2000	100	40.777	39.675	1.1102	55	21.822	22.426
1.1910	95	38.738	37.692	1.1000	50	20.388	19.837
1.1822	90	36.700	35.707	1.0899	45	18.348	17.854
1.1721	85	34.660	33.724	1.0798	40	16.310	15.870
1.1701	84	34.252	33.328	1.0697	35	14.271	13.887
1.1620	80	32.621	31.746	1.0597	30	12.233	11.903
1.1599	79	32.213	31.343	1.0497	25	10.194	9.919
1.1515	75	30.582	29.757	1.0397	20	8.155	7.935
1.1410	70	28.544	27.772	1.0298	15	6.116	5.951
1.1308	65	26.504	25.789	1.0200	10	4.078	3.968
1.1206	60	24.466	23.805	1.0100	5	2.039	1.984

Med. use.—In its effects on the animal economy, and the mode of its employment, muriatic acid coincides with the acids already mentioned, which almost proves that they do not act by oxygenizing the system. On the contrary, according to Sir H. Davy's view of its constitution, it contains no oxygen, and can only act *chemically* by imparting chlorine or hydrogen to the system, or withdrawing from it oxygen or some other principle which has an affinity for chlorine or hydrogen.

It is given largely diluted as a refrigerant and antiseptic drink in fevers, in venereal cases, and in the phosphatic calculous diathesis. Less diluted, it is used as a gargle in malignant sore throat, and aphthous mouth; and in its concentrated state it is applied to *cancrum oris*, and malignant ulcers of the tongue.

Pharm. use.—Muriatic acid is employed to prepare dilute muriatic acid, muriate of baryta, solution of muriate of lime, tincture of muriate of iron and hydrosulphuret of ammonia. It is incompatible with the officinal alkalies, earths, and their combinations with carbonic and the vegetable acids, and with most of the metallic sulphurets, oxides, and their combinations with weak acids, and especially with the salts of silver and lead.

Off. Prep.—Ammoniæ bicarbonas, *D.* Potassæ bicarbonas, *D.* Sodæ bicarbonas, *D.* Aqua carbonatis sodæ acidula, *D.* Calcis phosphas præcipitatum, *D.*

ACIDUM NITRO-MURIATICUM. *Dub.*

Nitro-muriatic Acid [*].

Take of Nitric acid, one measure.
Muriatic acid, two measures.

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[*] *Syn.* Aqua regia.

Mix the acids in a refrigerated bottle, and keep the mixture in a cold and dark place.

On the mixture of the acids in the proportions assigned, the hydrogen of the muriatic acid abstracts from the nitric acid one of its proportionals of oxygen to form water, and the resulting fluid is a compound of nitrous acid with chlorine, dissolved in the water of both acids. As both the chlorine and nitrous acid are volatile, especially the former, on every increase of temperature they are ready to assume the gaseous form, and accidents sometimes arise from the sudden escape of the contents on opening the bottle. It is therefore advisable for medical use to dilute the mixture immediately when made with an equal quantity of water.

Med. use.—The employment of the nitro-muriatic acid in practical medicine originated in the hypothesis, now altogether abandoned, that mercury cured syphilis by imparting oxygen to the system. It was first recommended by Dr Scott of Bombay, and was adopted at first by many. It was used internally, and more frequently externally, in syphilis, and, from analogy, in hepatitis, and other diseases cured by mercury. For internal use a few drops daily, sufficiently diluted, will suffice. Externally it was applied, either by means of a sponge, or by immersing more or less of the body in a bath. The nitro-muriatic acid, for external use, is diluted so, that it is not more acid than very strong vinegar; for which purpose, about an ounce and a half of the strong, or three ounces of the diluted acid, will be required for the gallon of water. Such a bath must be continued for several weeks to produce much effect, used at first daily, afterwards less frequently; and the immersion must last from twenty minutes to half an hour. The effects are said to be a tingling sensation in the skin of the part bathed, thirst, a peculiar taste in the mouth, and a specific action on the biliary system. Sometimes the skin is discoloured when the acid is too strong. The taste and thirst, I have satisfied myself, depend upon the direct contact of the acid fumes with the inner surface of the mouth; and I cannot say that my experience, probably too limited, has convinced me of the therapeutical effects ascribed to it.

AQUA CHLORINII. *Dub.*

Water of chlorine [*].

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[*] *Syn.* Aqua oxymuriatica, Acidum muriaticum oxygenatum, Chlorinium aqua solutum, Aqua superoxydi muriatosi.

Take of Muriate of soda, dried, one hundred parts;
Oxide of manganese, thirty parts;
Sulphuric acid, eighty-seven parts;
Water, one hundred and twenty-four parts.

Add the acid gradually to the water, and when cold pour the mixture upon the muriate of soda and oxide of manganese, well mixed, and put into a retort. Then, by means of a proper apparatus, and of a moderate heat, gradually increased, transmit the gas arising from the mixture through two hundred parts of distilled water, and stop the process as soon as the effervescence in the retort ceases. Keep the water of chlorine in glass bottles, well stopped, and in a dark place.

THE oxide of manganese employed in this process is the peroxide. It consists of one equivalent of manganese, 28, and two of oxygen, 16=44. It parts very readily with the second proportional of oxygen, and is often used to furnish oxygen gas by the mere application of heat. In the present process, the sulphuric acid acts at the same time upon the muriate of soda, forming sulphate of soda, and disengaging muriatic acid; and upon the peroxide of manganese, forming a sulphate with the protoxide, and disengaging oxygen: but the oxygen and muriatic acid thus presented to each other in their nascent state react upon each other; the oxygen combines with the hydrogen of the muriatic acid, forming water, and chlorine is evolved, which is absorbed by the distilled water, through which it is transmitted in a proper pneumatic apparatus.

Chlorine, Sir H. Davy, (oxymuriatic acid gas of former chemists,) is of a yellowish-green colour, has an extremely disagreeable smell. 100 cubical inches weigh 75.375 grains, its specific gravity to hydrogen being 33.5 to 1; to air 2.495; is irrespirable, but supports combustion. It is not changed by heat or cold, or electricity; and when perfectly dry does not act on vegetable colours; but they are quickly destroyed by it when vapour or moisture is present. Water at 60° absorbs about double its volume, weighs 1.003, freezes at 40°, and acquires a strong acrid taste, and disagreeable smell.

Med. use.—When the chemical pathology was fashionable, water impregnated with chlorine was recommended as an antisyphilitic remedy, and certainly seemed, in some instances, to effect a cure; but it has since been laid aside. Mr Braithwaite also recommended it strongly in scarlatina. He gave, according to the age of the patient, from half a drachm to a drachm, in the course of the day, mixed with eight ounces of distilled water; but it is advisable to keep it divided into doses, in different phials, as it loses every time the phial is opened, and it should be kept in a dark place. Dr Willan confirms its use in cynanche maligna.

The vapours of this powerful chemical agent have been recommended by Morveau as the best means of destroying contagion; and when properly managed they may be even inhaled without much inconvenience. They are easily disengaged by mixing together ten parts of muriate of soda, with two parts of black oxide of manganese in powder, and pouring upon the mixture, first four parts of water, and then six parts of sulphuric acid. Fumes of chlorine immediately arise.

Morveau has since contrived what he calls Dis-infecting or Preservative phials. If intended to be portable, two drachms of black oxide of manganese, in coarse powder, are to be put into a strong glass phial, of about four ounces capacity, with an accurately ground stopper, to which must be added about two scruples of nitro-muriatic acid; the stopper is then to be replaced, and the whole secured by inclosing the phial in a strong wooden case, with a cap which screws down so as to keep the stopper in its place. They are used by simply opening the phial without approaching it to the nose, and shutting it as soon as the smell of the chlorine is perceived. A phial of this kind, if properly prepared, will preserve its power during many years. For small wards, strong bottles, with ground stoppers an inch in diameter, of about 25 or 27 cubic inches of capacity, may be used, with 372 grains of the oxide, and 3.5 inches of each of the acids, and the stopper kept in its place by leaden weights; or for larger wards, very strong glass jars, about 43 cubic inches in capacity, containing an ounce of the oxide, and 6 inches of each of the acids. These jars are to be covered with a plate of glass, adjusted to them by grinding with emery, and kept in its place by a screw. In no case is the mixture to occupy more than one-third of the vessel.

ACIDUM ACETICUM TENUE. *Ed.*
Weak Acetic Acid[*].

Let eight pounds of vinegar be distilled in glass vessels, with a gentle heat. The first pound which comes over in a sand bath, as being too watery, is to be set aside; the next five pounds are the Weak Acetic Acid. Continue the distillation as long as the acid is obtained colourless. But this last portion, as being too empyreumatic, and not fit for internal use, is to be mixed with the pound first obtained, and may be employed for various chemical purposes.

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[*] *Syn.* Acidum aceticum dilutum, Acidum acetosum, Acidum acetosum destillatum, Acidum aceticum debile.

ACETUM DISTILLATUM. *Dub.*
Distilled Vinegar.

Take of Vinegar, ten parts.

Draw off, with a gentle heat, eight parts.

Glass vessels are to be employed in this distillation, and the first part which comes over is to be rejected.

The specific gravity of this acid is 1005.

ACIDUM ACETICUM DILUTUM. *Lond.*
Dilute Acetic Acid.

Take of Vinegar, a gallon.

Distil off the acetic acid in a sand bath, from a glass retort, into a cooled glass receiver; then having thrown away the first pint, preserve the next six.

The purification of vinegar by distillation is now almost superseded by the manufacture of the pyrolignic acid; one pound of which, of sp. gr. 1.043, mixed with four pounds of water, give a dilute acid of 1.009, which is almost always substituted for distilled vinegar.

Vinegar, as obtained by fermentation, is a very heterogeneous fluid. To separate the dilute acetic acid which constitutes the greater part of it, is the object of the present process. Some of the foreign ingredients are more volatile than the acetic acid, and rise along with the first portion that comes over. Hence the Colleges direct the first portion, one-eighth, *Lond. Ed.*, one-tenth, *Dub.*, to be kept separate, according to that of Edinburgh, because it is too watery, but, according to Dr Barker, because it contains alcohol and pyroacetic spirit. The next portion constitutes the distilled vinegar. The Edinburgh College draws off five-eighths, and the London six-eighths; but the Dublin eight-tenths; it having been found by experiment that that proportion could be obtained pure. The residuum is still capable of furnishing acetic acid, and even of greater strength; but it is rendered empyreumatic, in consequence of the heat necessary to volatilize it decomposing some of the fixed contaminations.

Distilled vinegar should be colourless; have a pure acid smell and taste; and a *sp. gr.* about 1005. 100 parts should neutralize 14.5 of crystallized, or 5.2 of dry carbonate of soda, or three ounces one drachm of salt of tartar. It should not have a sulphureous or empyreumatic smell, or an acrid taste, or be affected by a solution of sulphate of soda, muriate of baryta, nitrate of silver, sulphuretted hydrogen, ferro-prussiate of potass, or water of ammonia; nor should it deposite copper on a bright iron plate immersed in it, or by the aid of heat dissolve gold leaf, diffused through dilute sulphuric and muriatic acid.

Med. use.—Distilled acetic acid, in its effects on the animal economy, does not differ from vinegar; and as it is less pleasant to the taste, it is only used for pharmaceutical preparations.

Off. Prep.—Ammoniæ acetatis aqua, *D.* Potassæ acetas, *D.* Sodæ acetas, *D.* Hydrargyri acetas, *D.* Plumbi acetas, *D.* Plumbi subacetatis liquor, *D.* Acetum colchici, *D.* Acet. opii, *D.* Acetum scillæ, *D.* Oxymel colchici, *D.* Oxymel, *D.* Oxymel cupri subacetatis, *D.* Ferri acetas, *D.* Emplastrum ammoniaci, *L. E.*

ACIDUM ACETICUM. *Dub.*

Acetic Acid *.

Take of Acetate of potass, one hundred parts.
Sulphuric acid, fifty-two parts.

Pour the acid into a tubulated retort, and gradually add the acetate of potass in different portions, waiting, after every addition, until the mixture cools; then distil off the acid, with a moderate heat, until the residuum become dry. The specific gravity of this acid is 1074.

ACIDUM ACETICUM FORTE. *Ed.*

Strong Acetic Acid.

Take of Sulphate of iron dried, one pound;
Acetate of lead, ten ounces.

Having rubbed them together, put them into a retort, and distil in a sand-bath, with a moderate heat, as long as any acid comes over.

MANY different processes have been proposed for preparing strong acetic acid. That of the Dublin College is very simple. It depends upon the superior affinity of the sulphuric acid for potass, by which the acetic acid is disengaged, and readily separated by distillation. A considerable increase of temperature takes place, in consequence of the action of the acid upon the salt; and hence the precaution of adding the latter by portions to the former, to prevent loss of product. According to the atomic equivalent proportions, 49 of liquid sulphuric acid are sufficient to decompose 116 of acetate of potass, or 42.2 to decompose 100; but 52 are directed to be added; the excess being on this, as on various other occasions, attended with advantages, such as rendering the decomposition more easy and complete, and leaving the residuum in the state of bisulphate. The acid prepared by this process of *sp. gr.* 1.074 contains about one part of pure acid combined with three of water.

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* *Syn.* Acetum concentratum, Acid. aceticum concentr., Acid. acetos. forte, Acidum aceticum radicale, Alcohol aceti.

In the last edition of the Berlin Pharmacopœia a less concentrated acetic acid, sp. gr. 1050 to 1060, is procured, by decomposing 64 parts of sugar of lead by 18 of sulphuric acid, diluted with 9 of water, which is to be rectified by re-distilling it from three ounces of powdered oxide of manganese, or one ounce of acetate of potass, or without addition, according as it is suspected to contain sulphurous acid, sulphuric acid, or lead.

By the superior affinity of sulphuric acid, the acid may be easily expelled from every acetate, whether alkaline or metallic; but part of the sulphuric acid seems to be deprived of its oxygen, and to be converted into sulphurous acid, which renders the product impure. This is said to be the process of the manufacturers of pyrolignic acid, who decompose acetate of lime by sulphuric acid.

The process of the Edinburgh College is that of M. Badollier. By mutual decomposition sulphate of lead is formed and acetate of iron, which latter salt is again decomposed by heat, the acetic acid being converted into vapour, and the oxide of iron remaining in the retort, mixed with the sulphate of lead. The sulphate of iron is previously dried to remove its water of crystallization, which would dilute the acetic acid too much. For this process a bisulphate is preferable to a neutral sulphate. Mr Lowitz directed one part of carefully dried acetate of soda to be triturated with three parts of bisulphate of potass, and the distillation to be conducted in a glass retort, with a gentle heat.

To these processes the French Pharmaceutists prefer that of the Parisian Codex. A coated earthenware retort is to be filled quite full of crystals of acetate of copper, dry, and slightly bruised. Heat is to be applied gradually until the acetate be exhausted. There remains in the retort a portion of charcoal mixed with metallic copper. These two last are in such a state of division as to produce a pyrophoric residuum, and it therefore frequently happens that it catches fire the moment it is taken out of the retort, although cold.

The liquid which is first obtained is colourless. It is a very weak acid, derived in a great measure from the water of crystallization of the salt. About the middle of the operation, the extremity of the neck of the retort and the adopter become covered with lamellated or needle-shaped crystals of a pale green colour, which are gradually washed over by the acid vapour, and colour the product. According to M. Robiquet, these are anhydrous acetate or super-acetate (of copper). At the end of the operation the vapour can scarcely be made to rise; and it becomes necessary to augment the fire to continue its disengagement; lastly, the operation is known to be terminated when the apparatus becomes cool, and no more gas is disengaged. The acid as first obtained contains a little copper; but it may be rectified, in the same apparatus, by substituting a glass retort for that of stoneware, and placing this on a sand-bath. The rectification ought not to be carried to dryness, because the last portion contains a certain quantity of empyreumatic oil, which would pass over into the receiver and communicate a disagreeable odour to the product. The acid thus obtained is colourless; it exhales a most agreeable odour, which is found only in acetic acid obtained from acetate of copper, and is owing to a spirit called *pyro-acetic*, which moderates its pungency.

The product is very nearly half of the weight of the acetate of copper used, and the residuum is only three-tenths; therefore, there is about a fifth part lost, arising from the portion of acid decomposed by the heat.

In this operation the oxide of copper readily yields its acid at a temperature so moderate, that the greater part of the acid does not undergo decomposition; but the oxide of copper being very easily reducible, its oxygen unites with the elements of a part of the acid, and thereby forms water which is mixed with the gaseous products, carbonic acid gas, carbonated hydrogen, and carbonic oxide, which are disengaged.

Med. use.—From the volatility and pungency of its vapour, it is often applied to the nostrils, as an excitant in cases of syncope and asphyxia, and as an antispasmodic in nervous headach. As a convenient mode of using it, small ground stoppered phials, mounted with silver, are filled with granulated sulphate of potass; this salt is then impregnated with concentrated acetic acid, and some drops of a volatile oil, such as lavender, bergamot, or roses, are added. Applied to the skin, and covered so as to prevent its evaporation, acetic acid is a very speedy rubefacient, and may be used in all cases when instantaneous counter-irritation is indicated. It is also used as a local application in aphthæ, ulcerated sore throat, gangrene, and as an escharotic in warts, especially venereal, and in chancres.

Off. Prep.—Acidum aceticum camphoratum, *D. E.*

ACIDUM BENZOICUM. *Ed.*
Benzoic Acid *.

Take of Benzoin, twenty-four ounces;
Subcarbonate of soda, eight ounces;
Water, sixteen pounds.

Triturate the benzoin with the subcarbonate, then boil in the water for half an hour, with constant agitation, and strain. Boil what remains of the balsam with other six pounds of water, and strain. Mix these decoctions, and evaporate, until two pounds remain. Filter anew, and drop into the fluid, as long as it produces any precipitation,

Dilute sulphuric acid.

Dissolve the precipitated benzoic acid in boiling water, strain the boiling solution through linen, and set it aside to crystallize. Wash the crystals obtained with cold water, dry and preserve them.

Lond. †.

Take of Benzoin, one pound.

Put the benzoin into a glass vessel set in a sand-bath, apply a heat of 300°, and gradually increase it till nothing more arise. Wrap the sublimate in bibulous paper, and compress it to separate the oil; lastly, sublime it a second time, with a heat not exceeding 400°.

Dub.

Take of Benzoin, five parts;
Fresh quicklime,
Muriatic acid, of each, one part;
Water, two hundred parts.

Triturate the benzoin with the lime; then boil for half an hour in one hundred and thirty parts of the water, constantly stirring the mixture with a rod; allow the vessel to rest, and decant off the liquor when cold. Boil the residuum in seventy parts of water, and again decant off the liquor after it has become cold. Mix the liquors; boil them down to one-half, and gradually drop in the muriatic acid. Lastly, having poured away the liquors, wash the precipitate with a small quantity of cold water, dry it with a gentle heat, put it into a proper apparatus, and sublime the benzoic acid with a slow fire.

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* *Syn.* Acidum benzoicum per precipitationem.

† *Syn.* Acidum benzoicum per sublimationem, Flores benzoes.

The distinguishing character of balsams is their containing benzoic acid, which may be separated from the resin, their other principal constituent, either by simple solution in water, or sublimation, or by first combining it with a salifiable base, and then procuring the benzoic acid by precipitation. The London College adopts the second method. But, even with the greatest care, it is almost impossible to manage the heat so as not to decompose part of the resin, and thus give rise to the formation of an empyreumatic oil, which contaminates the product. Nor can it be freed completely from the empyreumatic oil by bibulous paper. It is however the least troublesome and most advantageous process.

The other method of separating benzoic acid from resin was first practised by Scheele, who employed lime water; Göttling afterwards used subcarbonate of potass; and, lastly, Gren used subcarbonate of soda, which has been adopted by the College of Edinburgh. The process of the Dublin College is a modification of Scheele's.

A larger product is obtained by simple sublimation, as prescribed by the London College; but it is less white, and has more of the peculiar balsamic odour of benzoin. That prepared by the process of the Dublin approaches much more to chemically pure benzoic acid; but it is doubtful, as stated by Dr Barker, whether it be any advantage, as the virtues may arise chiefly from the oil, which is the cause of the colour and smell.

Benzoic acid is obtained by sublimation in white feathery crystals, soft and elastic, not pulverizable; by crystallization in flat, oblique, transparent prisms: when pure it is almost inodorous, and has an acrid, slightly acid taste. It is fusible, and evaporates by heat, for the most part, without change. It is also inflammable, and burns entirely away. It is permanent in the air. It is very sparingly soluble in cold water; but at 212° it dissolves in about 24 waters. It is also soluble in hot acetic acid. It is soluble, without change, in alcohol, in concentrated sulphuric and nitric acid, and is separated from them by water.

Med. use.—Benzoic acid is now almost obsolete, and is only continued from usage in some long-established formulas. It was supposed to be an expectorant, but without any just foundation. It is an ingredient in some balsamic pills, and in cosmetic washes. It is sometimes applied externally in fumigations.

Off. Prep.—Tinct. camphoræ comp. *L. D.* Tinct. opii ammoniata, *E.*

ACIDUM CITRICUM. *Dub.*
Citric Acid *.

Take of Lemon juice, any quantity;
Prepared chalk, as much as may be necessary.

Add the chalk gradually to the lemon juice made hot, and then pour off the liquor from the residuary citrate of lime. Wash this several times with hot water, and then dry it. To the dried powder add dilute sulphuric acid to the extent of eight times the quantity of chalk previously added. Boil the mixture, then express strongly through linen, and filter through paper. Evaporate the liquor that it may crystallize on cooling. Purify the crystals by repeated solution and crystallization.

Lond.

Take of Lemon juice, one pint;
Prepared chalk, one ounce, or as much as may be required to neutralize the acid;
Diluted sulphuric acid, nine fluidounces.

To the lemon juice, heated to ebullition, gradually add the chalk, and mix them. Then decant the liquor, and wash the citrate of lime, which remains behind, repeatedly with water. Dry it, and then pour upon the dried powder the diluted sulphuric acid; boil for ten minutes, strain it through a cloth with strong expression, and filter through paper. Evaporate the filtered liquor with a gentle heat, until it form crystals on cooling.

In order to render the crystals pure, they must be dissolved twice, or oftener, in water, the solution filtered each time, evaporated and crystallized.

In this process the citric acid of the lemon juice first unites with the lime, and forms a nearly insoluble citrate of lime. This is next decomposed by the sulphuric acid, which forms an insoluble sulphate of lime, and the citric acid is set at liberty, dissolved in the water furnished by the dilute sulphuric acid, from which it is readily obtained by crystallization.

For English manufacture the lemon juice is imported from a distance, and requires to be examined. Its specific gravity, when of a good quality, varies from 1.0312 to 1.0625. In following the process of Scheele given in the Dispensatory, the citrate of lime should be washed, and strongly agitated with warm water, and these washings should be repeated until the water comes off perfectly clear. This is of the greatest importance to obtain a good product. Other precautions are to be taken, such as to add the sulphuric acid by degrees, and to mix it well, otherwise portions of the citrate will cake, owing to the consolidation of the sulphate of lime. The state of the solution may be ascertained by nitrate of barytes. The precipitate formed ought to be almost entirely soluble in pure diluted nitric acid, if the decomposition has been complete. In the contrary case, throw the whole mixture into a leaden boiler, and heat it slightly; and if the precipitate formed by nitrate of barytes be still insoluble, (which proves that too much sulphuric acid has been employed,) add a little calcareous citrate, and let the whole react. When the just point of neutralization has been attained, after letting it deposit the sulphate of lime, filter and wash the residuum with cold water, to dissolve as little as possible of the sulphate of lime; then evaporate in pewter or lead basins, or stoneware pans, in a water-bath, until the surface of the liquor get covered with small crystals, which make a pellicle covering the surface of the liquor. The acid obtained requires to be crystallized anew. From 160 pounds of lemon juice of good quality, eighteen ounces of calcareous citrate are obtained, and from these ten ounces of white citric acid.

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* *Syn.* Acidum limonis.

The citrate of lime is sometimes prepared in the countries where the lemons grow; and Mr Parkes, Tilloch's Journal, vol. xlvi. p. 60, on the authority of a manufacturer in Sicily, has given some curious details on the subject. The quantity of citrate produced by every pound of chalk varied from 19 to 27 ounces, and from every gallon of juice from 8¼ to 12¾ ounces. This disparity arose from inequality in the acidity of the juice, and from the same quantity of chalk being used with every kind of juice. The chief difficulty of the manufacture consisted in drying the citrate.

The crystals of citric acid are rhomboids, whose sides meet in angles of about 60 and 120°, and whose extremities are terminated by four trapezoidal faces, which embrace the solid angles.

Med. use.—See ACIDUM CITRICUM in the *Materia Medica*, p. 237.

Lemonade powder is made by mixing, as exactly as possible, 32 parts of citric acid, and 1000 of fine sugar passed through a tamis sieve. It is flavoured with volatile oil of lemons, of which an *oleo-saccharum* has been made before adding it to the other ingredients. It is to be kept in very dry and well-corked bottles.

ACIDUM PRUSSICUM. *Dub.*
Prussic Acid[*].

Take of Cyanuret of mercury, one ounce;
Muriatic acid, seven fluiddrachms;
Water, eight fluidounces.

Distil off eight fluidounces from a glass retort into a cooled receiver. The product is to be kept in a well-stopped phial, and in a cold and dark place. Its specific gravity is 998.

CAYANURET (bi-cyanide) of mercury and muriatic acid mutually decompose each other. The chlorine of this acid combines with the mercury, forming bichloride of mercury, which is comparatively fixed, while the hydrogen of the acid combines with the cyanogen and forms hydrocyanic acid, which is exceedingly volatile. In the process of this college, where there is a considerable proportion of water present, a different explanation may be given. An equivalent of the water is decomposed, the oxygen unites with the mercury, and converts it into peroxide, which combines with the muriatic acid, and forms permuriate of mercury, while the hydrogen unites with the oxygen of the decomposed water, and forms hydrocyanic acid. These products are easily separated by distillation, as directed by the college.

Chemists have directed their attention chiefly to procure hydrocyanic acid of the greatest possible purity and concentration; but the object of the pharmaceutist is to procure it in the most uniform and most durable state. This object is much more readily obtained by preparing it in a considerable degree of dilution, and such is the product of the collegiate process. Dr Barker procured from equal weights 480 grains of the cyanuret, and muriatic acid, following otherwise the directions of the Pharmacopœia, about 7 oz. and 5 drs. of hydrocyanic acid of sp. gr. 998.

In the Parisian codex there are no less than three methods of preparing this acid. One is of Gay-Lussac, which corresponds with that described, except that no water is added, and that the acid is freed, by means of chloride of lime and carbonate of lime, from all water and muriatic acid. This yields an acid of 700, and, when diluted with an equal weight of distilled water, according to the direction of Robiquet, becomes 900.

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[*] *Syn.* Acidum hydrocyanicum, Acid. Borrussicum, Acid. zooticum.

Another method is that of Scheele, in which 128 parts of pure cyanuret of iron, (Prussian blue,) 64 parts of peroxide of mercury, and 500 of distilled water, are boiled together for a quarter of an hour; the solution, containing hydrocyanate of mercury, is filtered through paper, the residuum washed with 128 parts additional of boiling distilled water. To the solutions mixed are added 96 parts of levigated filings of iron, 24 parts of oil of vitriol, and 24 of distilled water. After sufficient agitation, the matrass containing the mixture is immersed in cold water, and allowed to rest until the sediment subside. The liquor, containing sulphates of iron and of mercury with hydrocyanic acid, is then subjected to distillation, and 192 parts drawn off. This is mixed with 8 of carbonate of lime, and redistilled, 128 only being drawn off.

A third method is that of Vauquelin. He dissolves 100 parts of bicyanide of mercury in 800 of distilled water with a gentle heat. He transmits through the solution a stream of sulphuretted hydrogen in slight excess. Sulphuret of mercury is separated, which is removed by filtration. The liquor contains only hydrocyanic acid, and a little sulphuretted hydrogen. This is easily got rid of, by agitating it with a little carbonate of lead, and filtering the liquor a second time, which affords a hydrocyanic acid of nearly the same density as that of Scheele, or of sp. gr. 900.

The very great intensity of action of the hydrocyanic acid, on the animal economy, renders it a problem of the highest importance to be able to ascertain its comparative strength, as prepared by different methods. Pure hydrocyanic acid is much lighter than water, and renders water to which it is added specifically lighter; therefore the weight of the dilute acid indicates in some measure its strength. Dr Ure has given a table of this kind, but it does not extend to the stronger states of the acid, as prepared by the foreign formulas, and, besides, the operation requisite for ascertaining the gravity requires great skill. He therefore recommends the use of the peroxide of mercury; and the quantity of this oxide, which 100 grains of the acid tried, is capable of dissolving, gives the quantity of real hydrocyanic acid present. 100 grains of acid, of sp. gr. 998, should dissolve a little less than 6.4 of oxide, and contain 1.6 of real acid. Acid of 995, the strength of the medicinal acid prepared at Apothecaries Hall, London, should dissolve 20 gr., which is equivalent to its containing 3.2 of real acid, or is of double the strength.

Hydrocyanic acid consists of an equivalent of nitrogen, 14, with two of carbon, 12, forming an equivalent of cyanogen, 26, combined with one of hydrogen, 1; so that the equivalent number of hydrocyanic acid is 27. In whatever way prepared, hydrocyanic acid should be limpid and colourless, have a pungent smell, generally compared to that of bitter almonds, and a peculiar taste of the same quality. It reddens litmus paper feebly, and unites with alkaline bases, forming hydrocyanates or prussiates; but it does not neutralise them, and is separate even by carbonic acid.

Med. use.—Hydrocyanic acid has been excessively praised by some writers as a sedative, especially in diseases of the lungs, or to allay irritation in phthisis pulmonalis, and in hooping cough; in painful diseases, as in cancers of the womb; in diseases of the heart, and in affections of the stomach. It has always appeared to me, however, not to be a safe substance for general practice; and the recent accident of seven persons being killed by it at one time in an hospital in Paris, although prescribed by a very experienced practitioner, has confirmed my opinion of its danger. It is liable to the twofold source of error, against which the practitioner cannot guard, that of being stronger than he had anticipated, or, what is fortunately much more frequently the case, of being much weaker, or almost effete. In the few trials I have made of it, this has always been the case. If it is to be tried, a certain quantity should be furnished at once to the patient; and the dose at first given should be perfectly safe, and gradually increased; and if it be necessary to use a second quantity, the same precautions must be again taken. Fortunately hydrocyanic acid is exceedingly transitory in its action; and if the patient can be kept alive for some hours, by artificial respiration, the recovery is complete.

OLEUM SUCCINI et ACIDUM SUCCINICUM. *Ed.*
Oil of Amber and *Succinic Acid* [*].

Take of Amber reduced to powder, and of pure sand, equal parts.

Mix them, and put them into a glass retort, of which the mixture fills one half; then adapt a large receiver, and distil in a sand-bath, with a fire gradually increased. At first, a watery liquor will come over, with a little yellow oil; then a yellow oil, with an acid salt; and, lastly, a reddish and dark coloured oil. Pour the liquor out of the receiver, and separate the oil from the water.

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[*] *Syn.* Sal succini volatile.

Press the succinic acid collected from the neck of the retort and sides of the receiver between folds of blotting paper, to free it from the oil adhering to it; then purify it by solution in warm water and crystallization.

Dub.

Take of Amber in coarse powder,
Pure sand, each one part.

Distil, with a heat gradually increased, an acid liquor, an oil, and a crystallized acid. Wrap these crystals in blotting paper, and compress them, to squeeze out the oil. Lastly, sublime them again.

The oil may be separated from the acid liquor by filtration through bibulous paper. Succinic acid exists completely formed in amber, according to Gehlen. It is united in it with a large quantity of oily matter. M. Chevreul has ascertained the same fact. But in the process employed for obtaining succinic acid the amber is completely decomposed. The sand is added to prevent the amber from running together into masses, and impeding the distillation; but as it renders the residuum unfit for the use of the varnisher, it is not advisable. According to Göttling, this distillation should be performed in a tubulated iron or earthenware retort, exposed to the immediate action of the fire; for he says, that a glass retort is incapable of supporting the necessary temperature.

Besides the succinic acid collected from the neck of the retort, and sides of the receiver, the oil washes down a portion of it into the receiver, and the watery liquor which comes over is saturated with it. But the whole of it may be obtained by agitating the oil with some boiling water, which will dissolve the acid. This solution is then to be added to the acid liquor, and the acid they contain is easily obtained by evaporation and crystallization. The acid may afterwards be purified by solution in boiling water and crystallization, according to the directions of the colleges. But even after repeated solutions and crystallizations, a portion of empyreumatic oil still adheres to the acid, and renders it impure. The process employed by Guyton de Morveau for purifying this acid consists in dissolving it in double its weight of nitric acid, and in evaporating the solution to dryness in a retort. The oil is decomposed; the succinic acid remains untouched; after this there is nothing to be done but to wash it with a little water, and then to dissolve it in boiling water, and crystallize it.

This acid crystallizes in quadrilateral, white, transparent prisms, unalterable by the air. 240 parts of boiling alcohol dissolve 177 parts of succinic acid; but in proportion as the solution cools it crystallizes anew.

An attempt has been made to shew the identity of the succinic acid with the benzoic.

Med. use.—Succinic acid, although retained in the Edinburgh and Dublin Pharmacopœias, is never used in medicine. It has been rejected from the London.

Off. Prep.—Oleum succini rectificatum, *D. E.* Oleum succini, *L.*

ACIDUM TARTARICUM. *Lond.*

Tartaric Acid.

Take of Supertartrate of potass, two pounds and a half;
Boiling distilled water, three gallons;
Prepared chalk, a pound;
Sulphuric acid, a pound.

Boil the supertartrate of potass with two gallons of the water; and gradually add the prepared chalk until no more bubbles arise; set the mixture aside that the tartrate of lime may subside; pour off the supernatant fluid, and wash the tartrate of lime repeatedly with distilled water, until it come away tasteless. Then pour on the sulphuric acid diluted with a gallon of the distilled water, and set it aside for twenty-four hours, stirring it occasionally. Filter the liquor, and evaporate in a water-bath, so as to form crystals.

Dub.

Take of Bitartrate of potass, in powder, ten parts;
Prepared chalk, four parts;
Sulphuric acid, seven parts;
Water, one hundred and twenty parts.

Mix the bitartrate of potass with one hundred parts of the water boiling hot, and gradually add the prepared chalk. Then, after the effervescence has ceased, pour off the limpid supernatant liquor. Wash the tartrate of lime which remains until it become tasteless. Add to the limpid liquors decanted off, a solution of muriate of lime, in sufficient quantity to precipitate all the tartrate of lime. Wash this with water until it become tasteless, and mix it with the former precipitate. Then add the sulphuric acid diluted with twenty parts of water, and digest the mixture in a moderate heat, with frequent agitation, for three days.

Pour off the supernatant acid liquor, and wash the acid out of the sediment. Mix the liquors with the acid liquor and the washings, and evaporate them by a gentle heat to crystallize. Purify the crystals by repeated solution and crystallization, and keep them in a close glass vessel.

The bitartrate of potass, as its name implies, consists of two equivalents of tartaric acid and one of potass. Now, although potass has a stronger affinity for one equivalent of tartaric acid than lime has, it has not so strong an affinity for the second proportional. Therefore, by the addition of chalk, tartrate of potass and tartrate of lime are formed, while the carbonic acid escapes by effervescence. The tartrate of lime is the insoluble precipitate, while the tartrate of potass remains in solution. On the addition of a solution of muriate of lime to this solution, there is a mutual decomposition, muriate of potass is formed, which remains in solution, and the whole tartaric acid is precipitated in the state of tartrate of lime. In the next step of the process, the tartrate of lime is decomposed by the superior affinity of the sulphuric acid, which forms sulphate of lime, and the tartaric acid is separated dissolved in the water. The subsequent purification needs no explanation. In the London process, only the first equivalent of tartaric acid is obtained; but from the solution from which it has been precipitated, tartrate of potass may be got by evaporation and crystallization.

The crystals of tartaric acid are of considerable size, permanent, soluble in five waters at 60°, more soluble at 212°, without smell or colour, and very acid to the taste; act upon metals which decompose water, and combine with the alkalies and most of the earths and oxides. Its solution in water becomes mouldy; and the dry acid, when exposed to heat, is partly decomposed and sublimed in the state of pyrotartaric acid. It decomposes the salts of potass, forming with them bitartrate, and produces insoluble precipitates in solutions of lime and lead.

Med. use.—Tartaric acid is now very commonly used as a substitute for citric acid in the preparation of refrigerant drinks and effervescing draughts. The white papers in what are called soda powders contain *tartaric acid;* the blue *bicarbonate of potass.* The preparation called citrated kali is, I believe, a mixture of tartaric acid and bicarbonate of potass, which effervesces on being thrown into water. Merat found, that after being kept some time, it attracted humidity, and effervesced only feebly; but I understand, that to preserve it, the addition of a little alcohol is necessary. Dr

Barker has given a table of the quantity of the various carbonated bases necessary to neutralize 75 parts of crystallized tartaric acid, *viz.* 70 parts of dry carbonate of potash, 101 when crystallized; 54 dry carbonate of soda, 144 when crystallized; 39 carbonate; 61 bicarbonate; 79 hydrated bicarbonate, and 118 hydrated sesqui-carbonate of ammonia.

CHAP. III.—ALKALIES, and ALKALINE SALTS.

AQUA POTASSÆ. *Ed.*

Solution of Potass *.

Take of Newly prepared lime, eight ounces;
Carbonate of potass, six ounces;
Boiling water, twenty-eight ounces.

Pour upon the lime in an iron or earthen vessel twenty ounces of the water. After the ebullition is finished, instantly add the salt dissolved in eight ounces of the water; and having thoroughly mixed the whole, cover the vessel till they cool. When the mixture has cooled, agitate it well, and pour it into a glass funnel, the throat of which is obstructed with a piece of clean linen. Cover the upper orifice of the funnel, and insert its tube into another glass vessel, so that the Solution of Potass may gradually drop through the rag into the lower vessel. As soon as it ceases to drop, pour into the funnel some ounces of water, but cautiously, so that it may swim above the matter in the funnel. The Solution of Potass will again begin to drop, and the affusion of water is to be repeated in the same manner, until three pounds have dropped, which will happen in the space of two or three days; then mix the superior and inferior parts of the liquor together by agitation, and keep it in a well-stopped phial.

LIQUOR POTASSÆ. *Lond.*

Solution of Potass.

Take of Subcarbonate of potass, one pound;
Fresh quick-lime, half a pound;
Distilled water, boiling, a gallon.

Dissolve the potass in two pints of the water; add the rest of the water to the lime. Mix the liquors while hot; set the mixture aside in a covered vessel; and after it has cooled, filter it through cotton cloth. If any diluted acid, dropped into it, excite effervescence, more lime must be added, and the filtration repeated. A pint of this liquor should weigh sixteen ounces.

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* *Syn.* Liquor kali caustici, Potassa liquida, Lixivium causticum, Lixivium causticum vegetabile, Liquor potassæ, Aqua kali caustici, Liquor hydratis kalici.

POTASSÆ CAUSTICÆ AQUA. *Dub.*
Water of Caustic Potass.

Take of Pearlashes,
Fresh burnt quick lime, of each two parts;
Water, fifteen parts.

Sprinkle one part of water upon the lime placed in an earthen dish, and immediately when it is slaked mix in the salt, then add the rest of the water. Put the mixture when it has cooled into a well-closed bottle, and keep it for three days, with frequent agitation. After the carbonate of lime has subsided, decant off the supernatant liquor, and keep it in very well-stopped bottles of green glass. Its sp. gr. is 1080.

THESE processes do not differ materially. They are founded upon the affinity of lime being stronger than that of potass for carbonic acid. Therefore, when lime comes in contact with carbonate of potass, the carbonic acid quits the potass to unite with the lime, and the results of the mixture are potass and carbonate of lime.

On this process several remarks occur. The proportion of lime to the alkaline salt prescribed by the Colleges is very different. With six parts of the salt the Edinburgh use eight, the Dublin six, and the London only three. According to the atomic scale of equivalents, 28 parts of lime are sufficient to decompose 70 of potashes; but Dr Barker found, by experiment, that a less proportion of lime than five-sixths of the weight of the alkaline salt was insufficient for the purpose. The most obvious inconvenience arising from using an excess of lime is the bulk of the residuum, which requires the employment of larger vessels than otherwise would be necessary; and the spongy nature of the residuum, which retains a considerable portion of the solution. This inconvenience is, however, in a great measure, obviated, by pouring on an additional quantity of water, as directed by the Edinburgh College.

The Colleges also differ in the proportion of water they employ. With twelve parts of alkaline salt the Edinburgh College uses 56 of water, the Dublin 90, and the London 120. At first consideration, this difference might only seem to affect the strength of the alkaline solution obtained; but it appears, from the experiments of Dr Barker, that with a less proportion of water than that ordered by the Dublin College, the alkali cannot be totally deprived of its carbonic acid.

From the sparing solubility of lime in water, and the total insolubility of its carbonate, its full operation does not take place immediately, or without assistance. On this account the Dublin College direct the mixture to be frequently agitated, during three days, in a well-stopped bottle.

The Colleges differ also in the manner of separating the solution from the residuum. The Dublin College decant off the ley; the other Colleges filter it.

From the weight and density of the carbonate of lime, it is easy to pour off the greater part of the caustic ley; and as it is in this way exposed, for a very short time, to the action of the air, it does not absorb from it any notable quantity of carbonic acid, and is therefore very caustic. The only objection is the waste of the portion retained among the particles of the residuum; but this may be procured by filtration. The London and Edinburgh Colleges prescribe filtration. The objection to this method is, that as commonly performed, it brings the caustic solution too much in contact with the atmosphere. Mr Donovan invented a method by which this was, in a great measure, prevented; but as his apparatus seemed to me to be difficult of execution, and liable to be broke, I attempted a modification of it, which I find to answer perfectly. It consists of a funnel, through the throat of which a tube is passed, fitting it only loosely. Around the tube a bit of linen or cotton rag is wound, so as to make it fit the throat of the funnel; and over this a small quantity of very fine and well-washed sand is put, and then coarser sand to keep it steady. The tube is adjusted so as to rise up almost to the level of the upper surface of the funnel. The throat of the funnel fits closely a phial to receive the filtered liquor, and the surface is covered by a glass plate. By this arrangement, while the fluid drops into the phial below, the air it displaces rises through the tube into the upper part of the funnel, and thus the fluid comes in contact with that small quantity of air only which the phial originally contained.

If the solution of potass be pure, it will be clear, without colour or smell, feel soapy, and will neither effervesce with acids, nor form a precipitate with subcarbonate of potass. If it effervesces, carbonic acid is present, and must be separated by again shaking the solution with a little lime, or by dropping it into lime water, as long as it produces any precipitate. But Mr Phillips has remarked, that even when a small quantity of carbonic acid is contained in it, no precipitate is produced unless a considerable quantity of lime-water be added; and in his late translation of the London Pharmacopœia, he says it is in vain to expect to preserve it so perfect, that lime-water shall occasion no precipitation. If, on the contrary, it contain lime, from too much of it having been employed in the preparation, it may be separated by dropping into the ley a solution of the subcarbonate of potass. When we have thus purified our solution of potass, it must be again filtered, to have it perfectly pure. It is necessary to keep the solution of caustic potass in phials of green glass; for it acts chemically upon those of white glass, and very soon destroys them. The phials should also be of small size, so that they may not be frequently opened.

Med. use.—The solution of caustic potass, under various names, has at different times been celebrated as a lithontriptic, and as often fallen again into disuse. The very contradictory accounts of its effects as a solvent are now, in some degree, explicable, since it has been discovered that urinary calculi are very different in their natures, so that some of them are only soluble in acids, and others only in alkalies. Of the last description are the calculi of uric acid, which are very frequent, and those of urate of ammonia. On these, therefore, alkalies may be supposed to make some impression; and that alkaline remedies, taken by the mouth, have occasionally relieved calculous complaints, is certain. It is however said, that their continued use debilitates the stomach; and M. Fourcroy has proposed to apply the remedy immediately to the disease, by injecting into the bladder a tepid solution of potass or soda, so dilute that it can be held in the mouth. Before the alkaline solution be injected, the bladder is to be completely evacuated of urine, and washed out with an injection of tepid water. After the alkaline injection has remained in the bladder half an hour or more, it is to be evacuated, and allowed to settle. If, on the addition of a little muriatic acid, a precipitate be formed, we shall have reason to conclude that the calculus contains uric acid, and that the alkali has acted on it.

Very dilute caustic alkaline solutions may also be taken into the stomach as antacids, but we possess others which are preferable. Mr Brandish has strongly recommended the solution of caustic potash for the cure of scrofula. He prescribes the addition of a drop or two of genuine oil of juniper to a pint of the liquor, and orders it to be taken twice a-day in the following doses: To a child from four to six, 1 drachm by measure; from six to eight, one drachm and a half; eight to fifteen, 2 drachms; fifteen to eighteen, two and a half; to adults 3 and sometimes 4. It should however be begun in rather smaller doses. The vehicle may be fresh beer, malt-tea, barley-water, or water-gruel.

Externally, alkaline solutions have been more frequently used, either very dilute, simply as a stimulus, in rickets, gouty swellings, gonorrhœa, and spasmodic diseases, or concentrated as a caustic, to destroy the poison of the viper, and of rabid animals.

POTASSA; olim CAUSTICUM COMMUNE ACERRIMUM. *Ed.*
Potass; formerly Strongest Common Caustic *.

Take of the Solution of potass, any quantity.

Evaporate it in a covered very clean iron vessel, till on the ebullition ceasing, the saline matter flow gently like oil, which happens before the vessel becomes red. Then pour it out on a bright iron plate; let it be divided into small pieces before it hardens, and immediately deposited in a well-stopped phial.

POTASSA FUSA. *Lond.*
Melted Potass.

Take of Liquor of potass, one gallon.

Evaporate the water in a bright iron vessel over the fire, until after the cessation of the boiling the potass melt. Pour this out upon an iron plate into proper moulds.

POTASSA CAUSTICA. *Dub.*
Caustic Potass.

Take of Water of caustic potass, any quantity.

Evaporate it over the fire in a very clean silver or iron vessel, until the ebullition having ceased, the saline matter, on increasing the heat, remain at rest in the vessel. Pour out the liquefied salt upon a silver or iron plate, and, while it is congealing, cut it into proper pieces, which are immediately to be put into a well-closed phial. During the evaporation, avoid the drops spirted up.

THIS operation must be performed in metallic vessels, because caustic potass, when hot, acts powerfully upon glass, and all kinds of earthen ware. It must also be performed as rapidly as possible, that the ley may not have time to absorb any carbonic acid from the atmosphere. The ebulli-

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[*] *Syn.* Kali causticum siccum, Lixivia pura, Lapis causticus, Deutoxidum potassii, Hydras kalicus.

tion ceases when all the water is expelled, except one equivalent of water, 9, for each equivalent of potass, 48. The heat is then to be increased a little, which renders the potass perfectly fluid, and gives it the appearance of an oil, when it is ready to be poured out, either on a polished plate, as directed by the colleges, or into iron moulds, such as are used for the melted nitrate of silver. When concreting upon a plate of metal, it may be marked by means of a knife, and when cold it is readily broken. The fragments are to be kept in a green glass bottle, with a glass-stopper very accurately ground to it.

Med. use.—Potass is only used as a caustic, or to form solutions of a known strength. Its use as a caustic is, however, inconvenient, from its rapid deliquescence, which renders it apt to spread.

POTASSA CUM CALCE; *olim* CAUSTICUM COMMUNE MITIUS. *Ed.*
Potass with Lime; formerly *Milder Common Caustic.*

Take of Solution of Potass, any quantity.

Evaporate it in a covered iron vessel till one-third remains; then mix it with as much new slaked and powdered lime as will bring it to the consistence of pretty solid pap, which is to be kept in a vessel closely stopped.

Lond.

Take of Liquor of potass, three pints;
Fresh quick lime, one pound.

Boil down the liquor to one pint, then add the lime previously slaked, and mix them intimately.

POTASSA CAUSTICA CUM CALCE. *Dub.*
Caustic Potass with Lime.

Evaporate water of caustic potass to one-fourth, then add as much fresh burnt lime, in powder, as will form a sufficiently thick mass, which is to be kept in a well-closed phial.

THE addition of the lime in this preparation renders it less apt to deliquesce, more easily managed as a caustic, and milder in its operation than fused potass.

SUBCARBONAS POTASSÆ. *Ed.*
Subcarbonate of Potass [*].

Let impure subcarbonate of potass be heated red hot in a crucible. Triturate it with an equal weight of water, after the fæces have subsided, pour the liquor into a very clean iron pot, and boil to dryness, stirring assiduously towards the end of the process, to prevent it sticking to the vessel.

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[*] *Syn.* Kali carbonicum, Kali subcarbonicum, Carbonas lixiviæ alkalinus, Carbonas potassæ alkalinus, Sal cinerum clavellatorum depuratus.

POTASSÆ CARBONAS E LIXIVO CINERE. *Dub.*

Carbonate of Potass from Potashes.

Take of Potashes in coarse powder,
Cold water, each one part.

Mix them by trituration, and macerate them for a week in a wide vessel, with occasional agitation. Filter the ley, and evaporate it to dryness, in a very clean silver or iron vessel. Towards the end of the evaporation, stir the saline mass constantly with an iron spatula. When thus reduced to coarse powder, put it into close vessels. Before the ashes are dissolved in the water, if they be not sufficiently pure, roast them in a crucible till they become white.

POTASSÆ SUBCARBONAS. *Lond.*

Subcarbonate of Potass.

Take of Impure potashes, in powder, three pounds;
Boiling water, three pints and a half.

Dissolve the potashes in the water, and filter, then pour it into a bright iron vessel, and evaporate the water by a gentle heat until the liquor become thick; then, having removed it from the fire, stir it constantly with an iron spatula until the salt become granulated.

A subcarbonate of potass may be prepared in the same manner from Tartar, previously burnt till it becomes of an ash colour.

SUBCARBONAS POTASSÆ PURISSIMUS. *Ed.*

Pure Subcarbonate of Potass *.

Take of Impure supertartrate of potass, any quantity.

Wrap it up in moist bibulous paper, or put it into a crucible, and burn it into a black mass, by placing it among live coals. Having reduced this mass to powder, expose it in an open crucible to the action of a moderate fire till it become white, or at least of an ash-grey colour, taking care that it do not melt. Then dissolve it in warm water; strain the liquor through a linen cloth, and evaporate it in a clean iron vessel, diligently stirring it, towards the end of the process, with an iron spatula, to prevent it from sticking to the bottom of the vessel. A very white salt will remain, which is to be left a little longer on the fire, till the bottom of the vessel becomes almost red. Lastly, when the salt is grown cold, keep it in glass vessels, well stopped.

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* *Syn.* Sal tartari, Subcarbonas potassæ, Subdeutocarbonas potassæ, Subcarbonas kali, Subcarbonas kalicum purum.

POTASSÆ CARBONAS E TARTARI CRYSTALLIS. *Dub.*

Carbonate of Potass from Crystals of Tartar.

Take of Crystals of tartar, any quantity.

Heat them to redness in a silver crucible, loosely covered, until they cease to emit fumes. Reduce the mass which remains to coarse powder, and roast it for two hours in the same crucible, without a cover, stirring it frequently. Boil this in twice its weight of water for a quarter of an hour, and pour off the liquor after it has become pure. Repeat this three times. Filter the mixed leys, and evaporate them in a silver basin. Granulate the salt which remains by frequent agitation while it is concreting, and then heat it to a dull red. Take it out of the vessel before it is quite cold, and keep it in well-stopped phials.

THERE is great confusion in the nomenclature of the alkaline carbonates. So long as taste, and the effect upon vegetable colours, were considered as tests of neutralization, potashes, salt of tartar, barilla and kelp, were considered as having alkaline properties, and they were therefore called *subcarbonates:* but since the atomic doctrine has become prevalent, the number of *prime equivalents* of alkali and acid in combination determines the nomenclature of chemists; and as their salts, when purified, consist of one equivalent of acid and one of alkali, they are called *carbonates.*

In the last edition of their Pharmacopœia, the Dublin College have adopted entirely the modern nomenclature of the chemists, while the London and Edinburgh still retain one that is becoming obsolete. Until they all agree, there can be no ambiguity in employing the terms, subcarbonate and bicarbonate, to designate the two officinal conditions of the alkalies, and in avoiding the use of the ambiguous term, carbonate, altogether. The following table gives a contrasted view of the present officinal nomenclatures.

Lond. and Ed.	Chemical and Dub.
Potassa.	Potassa.
——— subcarb.	——— carb.
——— carb.	——— bicarb.
Sodæ subcarb.	Sodæ carb.

Lond. and Ed.	Chemical and Dub.
Sodæ carb.	Sodæ bicarb.
Ammonia.	Ammonia.
———— subcarb.	———— carb.
Calx.	Calx.
—— carbonas.	—— carb.
Magnesia.	Magnesia.
———— carbonas.	———— carb.

The potass of commerce we have already shewn to contain a considerable proportion of foreign salts. By the simple process of lixiviation directed by the colleges, it is purified from those which are crystallizable; and, though it still contains muriate of potass and silica, it is sufficiently pure for the purposes of medicine. Mr Phillips says, when prepared from pearlash it consists of about 26 carbonic acid, 71 potash and water, 2 muriate of potash, and 1 sulphate of potash, and a little silica.

The purest subcarbonate of potass, in common use, is that obtained by incinerating crude tartar, as all the substances it contains, except the potass, are decomposed by the heat, and resolved, for the most part, into volatile products, such as, carburetted hydrogen, water, pyrotartaric acid and carbonic acid, which are dissipated, with the exception of one equivalent of the carbonic acid, which remains along with an excess of carbon. From this it is freed by lixiviation. Dr Barker found, from several experiments, that the quantity of alkaline carbonate obtained in this way does not exceed 31.2 *per cent.;* by theory it should yield 38.8. Salt of tartar consists of one equivalent of carbonic acid, 22, and one of potass, 48=70.

Purified pearlash should be very white, and as free as possible from silica, alumina, and foreign saline and metallic impurities. These are detected by saturating it with nitric acid, which throws down the silex, and by the addition of solution of caustic ammonia, of sulphuretted ammonia, of nitrate of baryta, and of nitrate of silver.

Salt of tartar should be very white, almost totally free from saline impurities, and totally from silex and alumina, which are detected by nitric acid and ammonia respectively.

Subcarbonate of potass is chemically incompatible also with many substances, both chemicals and galenicals. The former are well known; it neutralizes acids and acidulous salts; it decomposes salts of soda, ammonia, lime, magnesia, alumina, antimony, copper, iron, mercury, lead, silver, and zinc. It causes no precipitate in solution of tartrate of iron. Its action upon galenicals has not been so much studied, but it renders resinous and oily principles in general more soluble; it deepens the colour of all brown and red colouring matters, and it renders all the active alkaline principles, as morphia, quinia, and the astringent principle, insoluble.

Med. use.—Subcarbonate of potass is occasionally employed in medicine, generally in conjunction with other articles, particularly for the formation of saline neutral draughts and mixtures; but it is used also by itself, in doses from three or four grains to fifteen or twenty; and it frequently operates as a powerful diuretic, particularly when aided by proper dilution.

Off. Prep. of purified Pearlash.—Liquor potassæ, *L. E.* Liquor potassæ subcarbonatis, *L.* Potassa cum calce, *L.* Potassæ bicarbonas, *D.* Potassæ acetas, *L.* Potassæ sulphas, *D. L.* Potassæ bisulphas, *D.* Potassæ tartras, *L. D. E.* Potassæ sulphuretum, *L. E.* Potassæ sulphureti aqua, D. Magnesiæ carbonas, *L. E. D.* Mistura ferri comp. *L.*

Off. Prep. of Salt of Tartar.—Carbonas (Bicarbonas) potassæ, *E.* Potassæ carbonatis aqua, *D.* Aqua supercarbonatis potassæ, *E.* Potassæ acetas, *D. E.* Liquor arsenicalis, *L. E. D.* Æther sulphuricus, *D.* Æther nitrosus, *D.* Spiritus æthereus nitrosus, *D.* Decoct. aloes comp. *D.* Mistura ferri comp. *D.*

LIQUOR POTASSÆ SUBCARBONATIS. *Lond.*
Solution of Subcarbonate of Potass [*].

Take of Pearlashes, one pound;
Distilled water, twelve fluidounces.
Dissolve the subcarbonate of potass in the water, and filter through paper.

POTASSÆ CARBONATIS AQUA. *Dub.*
Solution of Carbonate of Potass.

Take of Salt of tartar, one part;
Distilled water, two parts.
Dissolve and filter. The sp. gr. is 1320.

THIS is an example of simple solution. That of the Dublin College is made with a purer alkali, and is less strong than that of the London. Dr Powell says, that the quantities ordered by the London College will commonly give a solution amounting to nearly 18 ounces in bulk; and Mr Phillips states its sp. gr. to be nearly 1.446.

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[*] *Syn.* Oleum tartari per deliquium, Liquor kali carbonici, Liquor carbonatis kalici, Subcarbonas potassæ liquidus.

Dr Barker has given a table of the quantity of carbonate (subcarbonate of potass,) contained in 100 parts of the solution of different sp. gr.

Sp. gr.	1530,	1337,	1242,	1191,	1157,	1133,	1115,	1103,	1093,	1083,
Parts,	50.00;	33.33;	25.00;	20.00;	16.66;	14.28;	12.50;	11.11;	10.00;	9.09.

Med. use.—This solution was much used, and was considered as a cosmetic for cleaning and smoothing the face. It was also looked upon as useful for facilitating the extraction of vegetable purgatives. It was added to tinctures in maceration or digestion.

Off. Prep.—Potassæ carbonas, *L.* Potassæ bicarbonas, *D.* Potassæ hydriodas, *D.*

CARBONAS POTASSÆ. *Ed.*

Carbonate of Potass [*].

Take of Salt of tartar, two parts;
Water, three parts.

Dissolve the subcarbonate in the water, and in a proper apparatus pass through it a stream of carbonic acid gas. Filter the solution, when it ceases to absorb acid, and afterwards evaporate with a heat not exceeding 180° Fahrenheit, so as to obtain crystals.

Carbonic acid gas is easily obtained from equal weights of carbonate of lime in powder and of sulphuric acid diluted with much water.

POTASSÆ CARBONAS. *Lond.*

Carbonate of Potass.

Take of Liquor of subcarbonate of potass, a gallon.

Transmit a stream of carbonic acid gas through the liquor of subcarbonate of potass, put in a proper vessel, until it be completely saturated. Filter the liquor, and evaporate with a heat which must not exceed 120° Fahren. until crystals are formed. Pour off the liquor, and dry the crystals on bibulous paper. The carbonic acid for this process is easily obtained from white marble and dilute sulphuric acid.

POTASSÆ BICARBONAS. *Dub.*

Bicarbonate of Potass.

Take of Purified pearlashes, one part;
Distilled water, two parts.

Dissolve and transmit through it, in a proper apparatus, a stream of carbonic acid gas, (which is evolved during the solution of white marble in dilute muriatic acid,) until the solution become turbid. Then filter and expose it again to the stream of carbonic acid gas until the alkali be saturated. Lastly, let it rest in a cool place until it form crystals, which are to be dried without heat, and kept in a close bottle.

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[*] *Syn.* Kali carbonicum neutrale, Kali carbonicum acidulum, Bicarbonas kalicus cum aqua.

SUBCARBONATE of potass is easily combined with another prime of carbonic acid, in three ways; 1*st*, By exposing it, in solution, to the contact of the air for a considerable time; 2*d*, By making a stream of carbonic acid gas, evolved from carbonate of lime by sulphuric acid, pass through a solution of it; 3*d*, By heating it gently with carbonate of ammonia, as proposed by Berthollet.

Of these processes the first is tedious and uncertain, the last expensive, and requiring much attention, the second is therefore preferred by all the Colleges. Mr Phillips objects to the employment of sulphuric acid for disengaging the carbonic acid gas, from its forming an insoluble sulphate of lime on the surface of the marble, thus preventing its decomposition, and the difficulty of removing it after the operation, and recommends muriatic acid diluted with twice its weight of water. But there is great danger that the carbonic acid gas will in this case be contaminated with muriatic acid. As soon as the alkali begins to be saturated with the carbonic acid, unless salt of tartar be used, the solution becomes milky, which is owing to the separation of silica, which potashes always contain. At this period, the Dublin College very judiciously direct it to be filtered, as it is less conveniently done after the bicarbonate begins to crystallize.

The next circumstance to be considered is the strength of the alkaline solution. The Colleges seem to intend, that there shall be enough of water to keep the whole bicarbonate formed in a state of solution, and that there shall not be more to prolong the evaporation. The Dublin College uses one of alkali to two of water; the Edinburgh two of alkali to three of water; and the London about 57 of alkali to 54 of water. Mr Brande and Mr Phillips recommend one of alkali to five of water. If the subcarbonate were perfectly pure and entirely converted into bicarbonate, this quantity would not be too much. But Mr Brande tells us that the carbonate is prepared on the great scale by dissolving 100 lbs. of purified subcarbonate in 136 pints of water, which, when saturated with carbonic acid, yields from 28 to 30 lbs. of crystallized carbonate; 50 lbs. of subcarbonate are then added to the mother liquor, with a sufficient quantity of water to make up 136 pints, and the operation repeated. This is not far from the proportion of the Edinburgh College. In fact, part of the salt crystallizes during the operation, and hence it is necessary that the tubes for transmitting the gas be of large calibre, and that they be examined during the operation. In carrying on this process on a large scale, strong compression is used to facilitate the absorption of the gas.

This salt is without colour or smell, and is scarcely alkaline to the taste. Its crystals are square prisms, terminated by quadrangular pyramids. It is soluble in four times its weight of distilled water, at a red heat loses half its carbonic acid, and at 212° its solution loses one-fourth. When fully saturated it causes no precipitate in a solution of sulphate of magnesia, and it precipitates corrosive sublimate white.

Med. use.—The same as the subcarbonate, but it is more agreeable to the palate and stomach.

AQUA SUPERCARBONATIS POTASSÆ. *Ed.*
Solution of Supercarbonate of Potass.

Take of Water, ten pounds;
Salt of tartar, one ounce.

Dissolve, and expose the solution to a stream of carbonic acid, arising from
Carbonate of lime in powder,
Sulphuric acid, each three ounces;
Water, three pounds, gradually and cautiously mixed.

The chemical apparatus invented by Dr Nooth is well adapted for this preparation. But if a larger quantity of the liquor be required, an apparatus must be used capable of giving sufficient pressure. The solution must be kept in well-corked vessels.

VERY powerful apparatus of different constructions are now employed for fabricating these saline waters, in which a great excess of carbonic acid is compressed into the fluid, and various very ingenious contrivances have been made for corking them without allowing the excess of the gas to escape. Nooth's apparatus is quite insufficient, except for a small quantity for immediate and domestic consumption.

As soon as the preparation is finished, the liquor should be drawn off into pint bottles, which are to be well corked, wired down, and kept in a cool situation. It should be perfectly transparent, and have an acidulous, not an alkaline, taste; and, when poured out of the bottles, it should sparkle.

Med. use.—In this solution, carbonate of potass is combined with excess of carbonic acid, by which means it is better adapted for internal use, as it is rendered not only more pleasant to the taste, but is less apt to offend the stomach. It has certainly been frequently of advantage in calculous affections, but probably only in those instances in which the stone consists of uric acid, or urate of ammonia; for, although supersaturated with carbonic acid, yet the affinity of that acid for potass is so weak, that it really operates as an alkali.

Six or eight ounces may be taken two or three times a-day. It in general proves powerfully diuretic, and sometimes produces transient inebriation. This last effect is ascribed to the carbonic acid.

SULPHAS POTASSÆ. *Ed.*

Sulphate of Potass *.

Dissolve the acidulous salt, which remains after the distillation of nitrous acid, in warm water, and having removed the superfluous acid by adding carbonate of lime in powder, set it aside until the fæces subside. Then evaporate the decanted solution, after being filtered, so that it crystallize.

Lond.

Take of the Salt which remains after the distillation of nitric acid, two pounds;
Boiling water, two gallons.

Mix them so as to dissolve the salt, and then add as much subcarbonate of potass as will saturate the excessive acid. Then boil to a pellicle, and, after filtration, set it aside to crystallize. Decant off the liquor, and dry the crystals on blotting paper.

Dub.

Let the salt which remains after the distillation of nitric acid be dissolved in a sufficient quantity of boiling water. Add as much potash as will saturate the superfluous acid. Let the filtered liquor be evaporated with a very gentle heat, that it may crystallize.

THIS salt is very seldom prepared directly, as it may be obtained from the residuum of many other preparations, by simple solution and crystallization; for so strong is the affinity between sulphuric acid and potass, that they scarcely ever meet without combining to form this salt. All the sulphates, except that of baryta, are decomposed by potass and most of its combinations; and reciprocally, all the compounds of potass are decomposed by sulphuric acid and most of its combinations; and in all these decompositions, sulphate of potass is one of the products.

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* *Syn.* Kali sulphuricum, Tartarus vitriolatus, Sulphas kalicus, Sulphas lixiviæ, Deutosulphas potassii, Arcanum duplicatum, Sal de duobus.

The greatest part of the sulphate of potass of commerce is obtained from the residuum of the distillation of sulphate of iron with nitrate of potass, by lixiviating it, supersaturating the solution with subcarbonate of potass, filtering it boiling hot, and allowing it to crystallize. The liquor remaining after the precipitation of magnesia is also a solution of sulphate of potass. It is likewise got in considerable quantities from the residuum remaining in the retort, after the distillation of nitrous acid; and the London and Dublin Colleges have given directions for obtaining it, in this way, by simply saturating the excess of acid with subcarbonate of potass. The Edinburgh College saturates the excess of acid by lime, and rejects the sulphate of lime formed; and Mr Phillips says it is more economical, as the sulphate of potass is not so valuable as the subcarbonate of potass used to make it.

Sulphate of potass forms small, transparent, very hard crystals of different forms, generally aggregated in crusts, and permanent in the air. It has a bitter taste, is slowly soluble in water, requiring 16 waters at 60°, and 4 at 212°. It is not soluble in alcohol. It decrepitates when thrown on live coals, and melts in a red heat.

It is an anhydrous salt, and consists of 40 dry sulphuric acid, and 48 of potassa, $=88$ sulphate of potassa. It is decomposed by the barytic salts; by the nitrates and muriates of lime and of strontia; by the tartrates partially; and by the salts of mercury, silver, and lead.

Med. use.—Sulphate of potass, in small doses, as a scruple, or half a drachm, is an useful aperient; in larger ones, as four or five drachms, a mild cathartic, which does not pass off so hastily as the sulphate of soda, and seems to extend its action farther.

POTASSÆ SUPERSULPHAS. *Lond.*

Supersulphate of Potass [*].

Take of the Salt which remains after the distillation of nitric acid, two pounds;
Boiling water, four pints.

Mix, dissolve the salt, and filter. Then boil down the solution to one-half, and set it aside to crystallize. Pour off the liquid, and dry the crystals on blotting paper.

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[*] *Syn.* Sal enixum, Tartarus vitrolatus acidus.

POTASSÆ BISULPHAS. *Dub.*
Bisulphate of Potass.

Take of Commercial sulphuric acid, two parts;
Purified potashes, as much as may be required;
Water, six parts.

Neutralize with the potashes one part of the sulphuric acid diluted with the water, then add the other part of the sulphuric acid, and evaporate the solution until it crystallizes on cooling.

THERE is no doubt that a perfect bisulphate of potass can be procured by the method of the Dublin College, and Dr Barker tells us that he has thus always procured it in the form of a congeries of minute prismatic crystals of an extremely acid taste. But this method is too expensive to be followed, when the same salt can be so readily obtained, according to the directions of the London College, from the residuum of the distillation of nitrous acid, when excess of sulphuric acid is employed. Its preparation, however, is attended with some difficulty. When the residual salt is dissolved in only about an equal weight of water, Mr Phillips found it deposite, on cooling, supersulphate of potass, without any appearance of pellicle: but if the solution be evaporated to a pellicle, according to the former directions of the college, the whole concretes into a solid mass; and when the solution is not sufficiently concentrated, the crystals obtained are sulphate of potass. It is soluble in two waters at 60°, and less than one at 212°. It is acid to the taste, reddens vegetable blues, and effervesces with alkaline carbonates. Mr Phillips found, that 100 grains required 25 of dried subcarbonate of soda for saturation. It consists of sulphuric acid, 80; potass, 48, and water, 18=146.

Med. use.—It is recommended by Lowitz for preparing acetic acid, by decomposing acetate of soda. It is a valuable medicine, as it enables us to give sulphuric acid in combination with an aperient salt, and is less disagreeable and more soluble than the neutral sulphate. It also, according to Dr Barker, answers for making an effervescing salt at little expense. Equal weights, as a drachm, of bisulphate of potass, and of carbonate of soda, may be dissolved each separately in two ounces of water, then mixed and drunk in a state of effervescence.

SULPHAS POTASSÆ CUM SULPHURE. *Ed.*

Sulphate of Potass with Sulphur *.

Take of Nitrate of potass in powder,
Sublimed sulphur, of each equal parts.

Mingle them well together, and inject the mixture, by little and little at a time, into a red hot crucible; the deflagration being over, let the salt cool, after which it is to be put into a glass vessel well corked.

THIS is a very expensive process, as the product amounts to only about four-tenths of the materials employed. At each projection the mixture melts, the sulphur floats like a brown oil on the surface of the nitre, and burns with a blue or intense white flame, giving out sulphurous acid fumes in abundance. The residuary mass consists of a white friable mass, intermixed apparently with undecomposed sulphur; and when triturated together, it forms a pale yellowish-white powder.

The constitution of this salt is not well ascertained. It has generally been considered as sulphate of potass with a little sulphur mixed with it. If it were so, the process is absurdly extravagant; but that this is not its constitution is proved by its being more soluble in water than sulphate of potass, forming a yellowish solution, and leaving undissolved only a little black matter, which is not sulphur. It exhales during solution a sulphureous smell, and its taste is manifestly sulphureous. The crystals obtained by evaporating this solution are generally brilliant quadrilateral prisms with an acute rhombic base; but this is also one of the forms of sulphate of potass. It precipitates muriate of barytes; and the addition of sulphuric acid neither throws down sulphur, nor evolves a sulphureous smell. Nevertheless it does not seem to be identical with sulphate of potass, and therefore its Edinburgh name, *Sulphas potassæ cum sulphure*, and the mode of preparation proposed by some, of simply triturating these substances together, are manifestly incorrect.

Med. use.—In its medical effects and exhibition, it agrees with sulphureous mineral waters, which contain a proportion of neutral salt.

A saline solution, having some resemblance in smell and operation to Harrowgate waters, may be made, by dissolving two drachms of this salt, one drachm of cream of tartar, and an ounce and a half of sulphate of magnesia, in two pounds of water. The dose is from two to four ounces.

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* *Syn.* Sal polychrestus Glaseri.

POTASSÆ NITRAS PURIFICATUM. *Dub.*
Purified Nitrate of Potass *.

Take of Nitrate of potass, one part.

Dissolve it in two parts of boiling water, and let it rest to crystallize by cooling.

THE nitre of commerce is never pure. It may contain the muriates of potass and of soda, oxide of iron, oxide of manganese and silica. From these, however, it can be in a very great degree purified by solution and crystallization. Nitre is soluble in its own weight of boiling water, and in about four times its weight of cold water. Therefore, by making a nearly saturated boiling solution, the less soluble salts are sparingly dissolved, while, on cooling, the greater part of the nitre crystallizes, and the salts, having little difference of solubility in hot and cold water, remain in solution in the mother water. Nitre is purified only for certain pharmaceutical preparations.

Off. Prep.—Æther nitrosus, *D.* Spiritus æthereus nitrosus, *D.*

ACETAS POTASSÆ. *Dub.*
Acetate of Potass †.

Take of Salt of tartar, any quantity.

Add to it, at different times, about five times its weight of distilled vinegar, heated to a moderate temperature. When the effervescence shall have ceased, and the liquor is somewhat evaporated, add, at intervals, distilled vinegar, until the mixture shall entirely cease to effervesce; continue the evaporation until a dry salt be procured, which is to be cautiously liquefied by increasing the fire a little. Dissolve the salt, after it has cooled, in water: filter the solution, and evaporate until, on removing it from the fire, it shall concrete into a crystalline mass, which should be very white. Put this, as quickly as possible, into vessels accurately closed.

Ed.

Take of Salt of tartar, one pound;
Dilute acetic acid, a sufficient quantity.

Boil the subcarbonate in five pounds of acetic acid, and add more acid at different times, till on the watery part of the preceding quantity being nearly dissipated by evapora-

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[*] *Syn.* Kali nitricum, Nitras lixiviæ, Deutonitras potassii, Nitrum crystallisatum, Nitras kalicum depuratum.

[†] *Syn.* Kali aceticum, Acetis potassæ, Terra foliata tartari, Acetas kali, Acetas kalicum.

tion, the new addition of acid ceases to raise any effervescence, which will happen when about twenty pounds of acid have been consumed. The mass is then to be slowly dried. The impure salt remaining is to be melted with a gentle heat, for a short time, but no longer than necessary, and afterwards dissolved in water, and filtered through paper. If the liquefaction has been properly performed, the filtered liquor will be limpid; but if otherwise, of a brown colour. Afterwards evaporate this liquor with a very gentle heat, in a very shallow glass vessel, so that on being removed from the fire it crystallizes. The acetate of potass ought to be kept in vessels very closely stopped.

Lond.

Take of Pearlashes, a pound and a half;
Strong acetic acid, two pints;
Distilled water, boiling, two pints.

Add the acid previously mixed with the water to the subcarbonate of potass, until it no longer cause effervescence, and filter the solution, which is to be evaporated first in a water-bath until the ebullition cease, and then exposed to a heat gradually increased until a pellicle form on the surface. Take off the pellicle and dry it on bibulous paper. Renew the evaporation several times, and remove and dry the pellicles in the same way.

This used to be both a troublesome and expensive preparation; for, when made with distilled vinegar, and by simply evaporating to dryness, the salt has always a dark unpleasant colour, which can neither be removed by repeated solution and crystallization, nor even by solution in alcohol. M. Fremy has ascertained that the colour is owing to the property which potass has of blackening the small quantity of vegetable matter which distilled vinegar always retains. Care must therefore be taken that, during the whole of the operation for obtaining the acetate, there be always a little excess of acid; and if the alkali prevail, this colouring of the vegeto-animal matter will be considerable. The operator must be particularly careful, in melting it, not to use a greater heat, nor keep it longer liquefied, than what is absolutely necessary: a little should be occasionally taken out, and put into water; and, as soon as it begins to part freely with its black colour, the whole is to be removed from the fire. The exsiccation of the solution of the salt, after it has been fused, must be conducted very carefully, as it is exceedingly apt to be decomposed, which would render a new solution and exsiccation necessary. Charcoal, and especially animal charcoal, also answer well for depriving the salt of this colour.

To ascertain the neutralization, litmus and turmeric paper should be alternately employed. Mr Phillips says, that rather more than 21 pints of distilled vinegar, of 1.007, are required to saturate 18 ounces of subcarbonate of potass.

The process of the London College is much simplified in consequence of the use of the pyrolignic acid, now officinal, which produces a white salt at once. It may be also mentioned, that this salt may be prepared by the decomposition of acetates; for example, of the acetate of lime, by tartrate of potass.

Acetate of potass has a sharp, somewhat pungent taste. It is deliquescent, and is soluble in about its own weight of water at 60°, but Mr Phillips says in half its weight at 40°. It is also, according to Dr Powell, soluble in four times its weight of alcohol. It is decomposed by the stronger acids; by a decoction of tamarinds; by the sulphates of soda and of magnesia; by muriate of ammonia; by the tartrate of soda and potass; and by some metalline salts. Its acid is destroyed by a high temperature. It consists of one proportional of acetic acid, $50 +$ one of potassa, 48, and two of water, $18 = 116$ acetate of potassa.

Med. use.—Acetate of potass, however prepared, is a medicine of great efficacy, and may be so dosed and managed as to prove either mildly cathartic, or powerfully diuretic: few of the saline deobstruents equal it in virtue. The dose is from half a scruple to a drachm or two. A simple solution, however, of subcarbonate of potass in vinegar, without exsiccation, is not inferior, as a medicine, to the more expensive salt. Two drachms of the alkali, saturated with vinegar, have produced, in hydropic cases, ten or twelve stools, and a plentiful discharge of urine.

Off. Prep.—Acidum aceticum, *D.* Hydrargyri acetas, *D. E.* Zinci acetatis tinctura, *D.* Ferri acetatis tinctura, *D.* Tinctura acetatis ferri cum alcohol, *D.*

TARTRAS POTASSÆ. *Ed.*

Tartrate of Potass [*].

Take of Subcarbonate of potass, one part;
    Supertartrate of potass, three parts, or as much as may be sufficient;
    Boiling water, fifteen parts.

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[*] *Syn.* Tartras lixiviæ, Tartris potassæ, Tartras kalicum, Tartaras kali, Tartarus tartarisatus.

To the subcarbonate of potass, dissolved in the water, gradually add the supertartrate of potass in fine powder, as long as it raises any effervescence, which generally ceases before three times the weight of the carbonate of potass has been added; then strain the cooled liquor through paper; and, after due evaporation, set it aside to crystallize.

Lond.

Take of Subcarbonate of potass, sixteen ounces;
Supertartrate of potass, three pounds;
Boiling water, one gallon.

Dissolve the subcarbonate of potass in the water, then add the supertartrate of potass in powder, until it cease to excite effervescence. Filter the liquor through paper. Then evaporate until a pellicle be formed, and set it aside to crystallize. Pour off the liquor, and dry the crystals on blotting paper.

Dub.

Take of Carbonate of potass, from potashes, five parts;
Bitartrate of potass, fourteen parts;
Boiling water, forty-five parts.

Gradually add the bitartrate of potass in very fine powder to the carbonate of potass dissolved in the water; strain the liquor through paper, evaporate it, and let it crystallize by cooling.

TARTARIC acid is capable of uniting with potass in two proportions, forming in the one instance a neutral, and in the other an acidulous salt. The latter is an abundant production of nature; but it is easily converted into the former, by neutralizing it with potass, or by depriving it of its excess of acid. It is by the former method that the colleges direct tartrate of potass to be prepared; and the process is quite simple. The evaporation must be conducted in an earthen vessel, for iron discolours the salt. It is easily crystallized, but the crystals become moist in the air. We have here a striking example of the change produced upon the form of crystals, by saturating the excessive acid of a super-salt, the primitive form of the supertartrate being a rectangular octohedron, and of the tartrate a rectangular tetrahedral prism. It has an unpleasant bitter taste. Its constitution is acid 66, potass 48, water 9=123. It is soluble in four parts of cold water, and still more soluble in boiling water, and it is also soluble in alcohol. It is totally or partially decomposed by all acids. On this account it is improper to join it with tamarinds, or other acid fruits; which is too often done in extemporaneous practice. It is also totally decomposed by lime, baryta, strontia, and magnesia, partially by the sulphates of potass, soda, and magnesia, and by the muriate of ammonia.

Med. use.—In doses of a scruple, half a drachm, or a drachm, this salt is a mild, cooling aperient: two or three drachms commonly loosen the belly; and an ounce proves pretty strongly purgative. It has been particularly recommended as a purgative for maniacal and melancholic patients. It is an useful addition to the purgatives of the resinous kind, as it promotes their operation, and at the same time tends to correct their griping quality.

POTASSÆ HYDRIODAS. *Dub.*
Hydriodate of Potass.

Take of Iodine, one part;
Sulphuret of iron, in coarse powder, five parts;
Sulphuric acid, seven parts;
Distilled water, forty-eight parts;
Solution of carbonate of potass, the quantity required.
Rectified spirit, six parts.

Mix the iodine, by trituration, with sixteen parts of the water, and put the mixture into a glass vessel. Pour upon the sulphuret, in a matrass, the acid previously diluted with thirty-two parts of the water, and by means of a tube fitted to the neck of the matrass, and reaching to the bottom of the glass containing the iodine and water, transmit the gas evolved through the mixture, until the iodine entirely disappear. Filter the liquor, and immediately evaporate it, at its boiling heat, to one-eighth, and filter a second time. • Then gradually add the solution of carbonate of potass, so as to saturate the acid, which is known by the cessation of effervescence. Expose the mixture to heat until it become dry, and leave a salt of a white colour. Pour upon this the spirit, and dissolve by the aid of heat. Lastly, decant the solution from the residuary salt, evaporate to dryness, and keep in a close phial.

THE object of the first part of this process is to convert the iodine into hydriodic acid. This is effected in consequence of iodine having a stronger affinity than sulphur has for hydrogen. Therefore, when a stream of sulphuretted hydrogen is transmitted through water in which iodine is diffused, the iodine unites with the hydrogen, and remains in solution, and the sulphur is precipitated. The decomposition is known to be completed, when the mixture loses entirely the reddish-brown colour which iodine gives to water. By means of filtration, the precipitated sulphur is easily separated. The solution is now colourless, and contains only hydriodic acid, and a little excess of sulphuretted hydrogen. By brisk evaporation, to prevent decomposition by the absorption of atmospheric oxygen, the liquor is now concentrated to one-eighth, and again filtered, to separate a little sulphur that may be precipitated. Solution of subcarbonate of potass is then added, until it no longer excite effervescence, and the neutralized solution evaporated to dryness. Lastly, advantage is taken of the property of hydriodate of potass, of being soluble in alcohol, to obtain it perfectly pure and unmixed with any iodate or subcarbonate of potass that may be present.

Hydriodate of potass exists only in solution. By exsiccation it is converted into iodide of potassium, which is a white salt, in cubical crystals. It consists of 100 hydriodic acid, and 37.426 potass. Its taste is acrid, and slightly bitter. It is deliquescent, soluble in water, 100 parts dissolving 136 at 60°, and 141 at 68°. It is fusible, and rises unchanged at a red heat. On account of its high price, it is liable to adulteration with muriate of soda; but the admixture may be detected by comparing the products obtained, by decomposing equal quantities of ascertained genuine salt and of the adulterated salt by nitric acid, and comparing the products. A deficiency of iodine, and the existence of muriatic acid, will indicate the adulteration, and its degree. I have examined two specimens of hydriodate of potash from Glasgow, both apparently from the same manufacture. Besides being different from the genuine salt in form, colour and smell, it effervesces on being boiled in water, is very sparingly, instead of being totally, soluble in rectified spirit; and when decomposed with peroxide of manganese and sulphuric acid it furnishes very little iodine. Dr Christison, who has also examined it, informs me that it contains carbonic acid equivalent to 64 *per cent.* of carbonate of potass!

Various other methods of preparing hydriodate of potass have been proposed. The simplest of them is one by Dr Turner, which consists in adding iodine to a solution of hydrosulphuret of potass, until the potass is exactly neutralized. The sulphur is precipitated, and the iodine unites with the hydrogen, combining at the same time with the potass.

A solution of hydriodate of potass has the property of dissolving iodine, and acquires a deep brown colour, constituting ioduretted hydriodate of potass, also one of Dr Coindet's remedies.

Med. use.—It is given internally in bronchocele, struma, and all other diseases in which iodine is indicated, in solution of 36 grains to the ounce of distilled water, either alone, or with the addition of 10 grains of iodine. Of either solution, the dose is 10 drops three times a-day. It is applied externally, made into an ointment.

Off. Prep.—Unguentum potassæ hydriodatis, *D.*

SUBCARBONAS SODÆ. *Ed.*

Subcarbonate of Soda[*].

Take of Impure subcarbonate of soda, any quantity.

Bruise it; then boil in water till all the salt be dissolved. Strain the solution through paper, and evaporate it in an iron vessel, so that after it has cooled the salt may crystallize.

Lond.

Take of Impure soda in powder, one pound;
Boiling distilled water, four pints.

Boil the soda in the water for half an hour, and filter. Evaporate the solution to two pints, and set it aside to crystallize. Throw away the residuary liquor.

Dub.

Take of Barilla in powder, one part;
Water, two parts.

Boil the barilla in the water, in a covered vessel, for two hours, agitating it from time to time. Strain the liquor, and boil the barilla which remains, after triturating it again with an equal quantity of water. This may be repeated a third time. Evaporate the leys, filtered and mixed, in a wide iron vessel, to dryness, taking care that the saline mass remaining be not again liquified by too great a degree of heat, and agitate it with an iron spatula until it become white. Lastly, dissolve it in boiling water; and evaporate the liquor until it acquire the sp. gr. of 1220, and expose it to the air at about the temperature of frost, that it may crystallize by cooling. The crystals are to be dried and kept in a close vessel. If the salt be not pure, repeat the solution and crystallization.

THESE directions are principally intended for the purification of the Spanish barilla, which is a fused mass, consisting, indeed, principally of carbonate of soda, but also containing charcoal, earths, and other salts. The two first causes of impurity are easily removed by solution and filtration, and the salts may be separated by taking advantage of their different solubility in cold and in hot water. But the preparation of carbonate of soda, by the decomposition of sulphate of soda, has now become a manufacture, and is carried to such perfection, that its further purification is almost unnecessary for the purposes of the apothecary.

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[*] *Syn.* Natrum carbonicum depuratum, Alkali minerale depuratum, Sal sodæ depuratus, Carbonas natricus cum aqua depuratus, Subcarbonas sodæ purificata, Subdeutocarbonas sodii, Soda aërata.

Subcarbonate of soda is either in crystals, or amorphous crystalline masses. The crystals are often of very large size, tabular, and have the form of an oblique rhombic prism. Its colour is white, taste alkaline, and it has alkaline reaction. It dissolves in twice its weight of water at 60, and in its water of crystallization at 212°. It effloresces when exposed to the air. It should not be affected by sulphuretted hydrogen, or ferro-cyanate of potass in solution. Its constitution is one prime acid, 22, one prime soda, 32, and ten primes water, 90 = 144.

Off. Prep.—Sodæ carbonas siccatum, *D. L.* Sodæ carbonatis aqua, *D.* Sodæ bicarbonas, *D. L. E.* Aqua carbonatis soda acidula, *D. E.* Sodæ acetas, *D.* Sodæ phosphas, *D. E.* Sodæ sulphas, *D.* Sodæ et potassæ tartras, *D. L. E.* Calcis carbonas præcipitatum, *D.* Ferri carbonas, *D. L. E.* Pilulæ ferri comp. *D. L.* Pilulæ subcarbonatis sodæ, *E.*

SODÆ CARBONATIS AQUA. *Dub.*
Solution of Carbonate of Soda.

Take of Carbonate of soda, any quantity.

Dissolve it in distilled water, so that its sp. gr. shall be 1024.

A solution of this strength is obtained by dissolving one ounce of carbonate of soda in a pound of distilled water.

IT is convenient to have a solution of this salt of an uniform degree of strength. An ounce of this solution neutralizes half an ounce of lemon juice, and then forms with it a pleasant effervescing draught. Dr Barker has given a table of the quantity of dry carbonate of soda, in solutions of different sp. grs., each part of the dry salt being equal to 4.42 of the crystallized.

Sp. gr.	1116,	1105,	1085,	1075,	1065,	1062,	1059,	1056,	1053,
Salt,	11.11;	10.00;	8.33;	7.14;	6.25;	5.68;	5.55;	5.26;	5.00.

SODÆ SUBCARBONAS EXSICCATA. *Lond.*
Dried Subcarbonate of Soda.

Take of Subcarbonate of soda, one pound.

Apply a boiling heat to the subcarbonate of soda in a clean iron vessel, until it be perfectly exsiccated, stirring it continually with an iron spatula. Lastly, reduce it to powder.

CARBONAS SODÆ SICCATUM.
Dried Carbonate of Soda.

Liquefy over the fire, crystals of carbonate of soda, in a silver crucible, and then, increasing the heat, stir the liquefied salt, until, by the consumption of the water, it become dry. Reduce it to fine powder, and keep it in close vessels.

SUBCARBONATE of soda, deprived of its water of crystallization, is a very excellent remedy, for which we are indebted to Dr Beddoes; he desires it to be prepared by simply exposing the pounded crystals before the fire. By simple deaquescence, crystallized subcarbonate of soda falls down into a fine permanent powder. Each ounce by exsiccation is reduced to 1280 grains. Whenever soda is prescribed in the form of pills, the deaquesced carbonate is to be used, as, when made of the crystallized salt, they crack, and fall to pieces by the action of the air upon them.

Med. use.—Dr Beddoes recommended the powder of effloresced soda, in calculous complaints, as a substitute for the supercarbonated alkaline waters, when these produced giddiness, or were too expensive; but its use has since been extended much farther; and it is found to be not only an excellent antacid, but seems almost to possess specific virtues in affections of the urinary organs. One or two scruples may be given, in the course of the day, in the form of powder, or in pills made up with soap and some aromatics.

SODÆ BICARBONAS. *Dub.*
Bicarbonate of Soda *.

Take of Carbonate of soda, two parts;
Water, five parts. Dissolve.

Expose the liquor, in a proper apparatus, to a stream of carbonic acid gas, evolved during the solution of white marble in dilute muriatic acid, until it cease to absorb gas. Let it remain at rest until it crystallize. Then evaporate the liquor by a heat not exceeding 120°, and let crystals again be formed by refrigeration, which are to be mixed with the former, dried, and kept in a close vessel.

CARBONAS SODÆ. *Ed.*

Take of Subcarbonate of soda, two parts;
Water, three parts.

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* *Syn.* Natrum carbonicum neutrale, Natrum carbonicum acidulum, Bicarbonas natricus cum aqua.

Dissolve the salt in the water, and pass through it a stream of carbonic acid gas, until it cease to be absorbed. Filter the liquor, and evaporate with a heat not exceeding 180, so that it form a crystalline mass. Carbonic acid is most easily obtained from equal weights of carbonate of lime in powder, and of sulphuric acid diluted with much water.

SODÆ CARBONAS. *Lond.*

Carbonate of Soda.

Take of Subcarbonate of soda, one pound;
Distilled water, three pints.

Dissolve the subcarbonate of soda in the distilled water; then transmit carbonic acid gas through the liquor placed in a proper vessel, until it be fully saturated, and set it aside to crystallize. Wrap the crystals up in bibulous paper; compress and dry them. Evaporate the remaining liquor, taking care that the heat do not exceed 120, until fresh crystals are formed. Compress these in the same manner, and dry.

THIS salt, which, Dr Thomson says, is easily prepared by suspending a saturated solution of subcarbonate of soda in a distiller's fermenting tun, bears the same relation to the subcarbonate of soda that the bicarbonate of potass does to its subcarbonate. Its constitution is two primes of acid 44, one of soda 32, and two of water 18=94. By heat it is readily converted into the carbonate or sesquicarbonate, which is found native in hard striated masses in the province of Sukena in Africa, and is called *Trona.*

The crystals of bicarbonate of soda are in white crusts, semitransparent, and permanent. Their taste is mild but still alkaline, and at 64° it is soluble in 13 times its weight of water.

According to Wollaston, exposed to a red heat it loses exactly one half of its acid, and is converted into subcarbonate.

Medical use.—The bicarbonate is used for effervescing draughts and mixtures, and the sesquicarbonate is manufactured for the use of soda-water makers. M. Robiquet has insisted upon the advantages which would result from the use of this bicarbonate in the treatment of urinary calculus; and has conceived that by its use not only the increase of calculi of uric acid, which are the most frequent, might be stopped, but also their development prevented, and that perhaps they might even be dissolved after they have been formed. In support of this idea, he has related a case observed along with Dr Favrot. M. D'Arcet has ascertained, by numerous observations, the salutary influence of the bicarbonate of soda on the functions of the stomach. He recommends the following pastilles: Take of bicarbonate of soda, dry and pure, 5 grammes; white sugar, 95 grammes; volat. oil of mint, 3 drops; mucil. of gum, *q. s.* Make them into pastilles of a gramme weight. As these pastilles attract the humidity of the air, they must be preserved in a dry place, and in a well-stopped bottle. Each pastille of the weight of a gramme ought to contain nearly 0.05 gram. of bicarbonate. One or two of them suffice to remove indigestion; three are rarely required. They also act as a prophylactic.

AQUA CARBONATIS SODÆ ACIDULA. *Dub.*
Acidulous Water of Carbonate of Soda.

Take of Carbonate of soda any quantity.

Dissolve it in such a quantity of water, that each pint shall contain one drachm of carbonate of soda. Then, in an apparatus adapted for retaining the gas, subject it to a stream of carbonic acid gas, evolved during the solution of bits of white marble in muriatic acid diluted with six times its weight of water, until the carbonic acid be in excess.

AQUA SUPERCARBONATIS SODÆ. *Ed.*
Solution of Supercarbonate of Soda.

Take of Water, ten pounds;
Subcarbonate of soda, two ounces.

Dissolve and pass through it a stream of carbonic acid gas, arising from
Powder of carbonate of lime;
Sulphuric acid, of each three pounds;
Water, three pounds, gradually and cautiously mixed.

Nooth's apparatus is well adapted for this process. But if a larger quantity of this solution be required, an apparatus must be used capable of furnishing sufficient pressure. The liquor should be kept in well-corked vessels.

BY supersaturating soda with carbonic acid, it is rendered more agreeable to the palate, and may be taken in larger quantities, without affecting the stomach. This is now in common use as a cooling beverage, under the title of *soda-water*; and it may not be unnecessary to mention, that its place cannot be at all supplied by what is sold as soda powders, which are not a highly supercarbonated soda, but merely a mixture of salts, which effervesces on being dissolved.

Indeed, one moment's reflection must shew the impossibility of reducing, to a solid form, a salt which cannot exist in solution, except under very great pressure.

SODÆ ACETAS. *Dub.* *.

Acetate of Soda.

Take of Carbonate of soda, any quantity;
Acetic acid as much as may be required to neutralize the alkali.

Evaporate until the solution acquire the specific gravity of 1276. Crystallize by cooling. Dry the crystals cautiously, and keep them in a close vessel.

CRYSTALLIZED subcarbonate of soda, according to Dr Barker, requires about eleven times its weight of distilled vinegar for its neutralization; but the point of saturation is easily known by the effervescence ceasing, and by the usual tests of litmus and turmeric papers.

Acetate of soda occurs in amorphous masses or striated prisms. It is perfectly white, rather efflorescent, has a sharp and bitterish taste. It dissolves in three times its weight of water, and in twenty-four of alcohol. It should be totally free from metallic impurities, and as free as possible from those of a saline nature. It should emit fumes of acetic acid on the addition of sulphuric acid, and the residuum should consist of sulphate of soda.

Med. use.—Its action on the body is the same with that of acetate of potass, and from not being deliquescent, its use is much more convenient. Dr Barker gives from one to four scruples as the dose.

PHOSPHAS SODÆ. *Ed.*

Phosphate of Soda †.

Take of Bones burnt to whiteness, and powdered, ten pounds;
Sulphuric acid, six pounds;
Subcarbonate of soda, a sufficient quantity.

Mix the powdered bones with the sulphuric acid in an earthen vessel, then add the water, and mix again; add nine pounds of water: then place the vessel in a vapour bath, and digest for three days; after which, dilute the mass with nine pounds more of boiling water, and strain the liquor through a strong linen cloth. Lastly, pour over the mass boiling water, until the whole phosphoric acid be washed out. Set aside the strained liquor, that the impurities may subside; decant the clear solution, and evaporate it to nine pounds. To this liquor poured from the impurities, and heated in an earthenware vessel, add subcarbonate of soda, dissolved in warm water, until the effervescence cease. Filter, and set it aside to crystallize. To the liquor that remains after the crystals are taken out, add a little subcarbonate of soda, if necessary, so as to saturate exactly the phosphoric acid; and dispose the liquor, by evaporation, to form crystals, as long as it will furnish any. Lastly, the crystals are to be kept in a well-closed vessel.

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* *Syn.* Natrum aceticum, Terra foliata tartari crystallizata, Acetas natricus cum aqua, Acetis sodæ.

† *Syn.* Natrum phosphoricum, Phosphas natricum, Subphosphas sodæ, Sal mirabile perlatum.

Dub.

Take of Burnt bones, in powder, ten parts;
Commercial sulphuric acid, seven parts.

Mix the powder in an earthen vessel with the sulphuric acid; gradually add seven parts of water, and agitate the mixture; digest for three days, adding, from time to time, more water, to prevent the mass from becoming dry, and continue the agitation: then add seven parts of boiling water, and strain through linen, pouring on boiling water repeatedly, until all the acid be washed out. Set aside the strained liquor until the fæces subside, from which pour it off; and reduce, by evaporation, to one-half: then add, of carbonate of soda, (dissolved in a sufficient quantity of warm water,) eight parts. Filter; and by alternate evaporation and cooling, let it form crystals, which are to be kept in a well-closed vessel. If the salt be not sufficiently pure, dissolve and crystallize it again.

In this process, the phosphate of lime of the bone ashes is decomposed by the sulphuric acid. This decomposition is, however, only partial. The sulphuric acid combines with part of the lime, and forms insoluble sulphate of lime. The phosphoric acid, separated from that portion of lime, immediately combines with the rest of the phosphate of lime, and forms biphosphate of lime, which is not further decomposable by sulphuric acid.

The biphosphate of lime, thus formed, is soluble in water; but, as the sulphate of lime, with which it is mixed, concretes into a very solid mass, it is, in some measure, defended from the action of water. On this account, the whole mass is directed to be digested, for three days, in vapour, by which means it is thoroughly penetrated, and prepared for solution in the boiling water, which is afterwards poured on it. It is probably to render the subsequent solution easier, that Thenard directs the bone-ashes to be made with water into a thin paste *(bouillé)* before the sulphuric acid is added to them.

Having thus got a solution of biphosphate of lime, it is next decomposed by subcarbonate of soda, dissolved in water. This decomposition, likewise, is only partial, as the soda deprives the biphosphate of lime of its excess of acid only, and reduces it to the state of phosphate. The phosphate of lime, being insoluble, is easily separated by filtration, and the phosphate of soda remains in solution. According to Thenard, the nicest point in the whole process is the determination of the proper quantity of carbonate of soda to be added. As the phosphate of soda does not crystallize freely, unless there be a slight excess of base, he directs that a little more carbonate of soda be added than what is merely sufficient to saturate the excess of acid in the biphosphate of lime, but not to continue the addition until it cease to produce any precipitate. We must also take care not to carry the evaporation of the solution of phosphate of soda so far as to form a pellicle; for it then concretes into an irregular mass, and does not form regular crystals. After each crystallization, we must examine the liquor which remains, and, if it be acid, or merely neutral, add to it a little of the solution of carbonate of soda. In this way, Thenard got 885 of phosphate of soda, from 2100 parts of bone-ashes, with 700 of sulphuric acid, and 667 of carbonate of soda. Dr Barker digested one pound of bone-ashes with eight-tenths of its weight of strong sulphuric acid, and supersaturated the liquor with 1 lb. 7 oz. of subcarbonate of soda. The product was 1 lb. 3 oz. of well-crystallized phosphate of soda.

Mr Funcke, of Linz, has discovered a still more economical and expeditious method. It consists in saturating the excess of lime in calcined bones with diluted sulphuric acid; and then dissolving the remaining phosphate of lime in nitric acid. To this solution he adds an equal quantity of sulphate of soda, and then recovers the nitric acid by distillation. The phosphate of soda is then separated from the sulphate of lime, by the affusion of water and crystallization.

Phosphate of soda crystallizes in rhomboidal prisms, terminated by three-sided pyramids. Its taste resembles that of common salt. At 60° it is soluble in four parts of water, and at 212° in two. It effloresces in the air. By heat, it undergoes the watery fusion, and at last melts into a white mass. It is decomposed by most of the salts having an earthy base.

Med. use.—Phosphate of soda was introduced into the practice of physic by the late Dr G. Pearson of London. It possesses the same medical qualities as sulphate of soda, and the tartrate of potass and soda, being an excellent purgative, in the quantity of an ounce or ten drachms; and it has the peculiar advantage over these two salts, of being much less nauseous than they are. Its taste is extremely similar to that of common salt; and, when given in a bason of gruel, or veal broth, made without salt, it is scarcely perceptible by the palate; and consequently it is well adapted for patients whose stomachs are delicate, and who have an antipathy against the other saline purges. The only objection to its general use is the very great difference between its price and that of the sulphate of soda and sulphate of magnesia.

SULPHAS SODÆ. *Ed.*

Sulphate of Soda *.

Dissolve in water, the acidulous salt, which remains after the distillation of muriatic acid; and having mixed powdered chalk with the solution, to remove the superfluous acid, set it aside until the sediment subsides; then strain through paper the liquor decanted from them, and evaporate so that it may crystallize.

Lond.

Take of the Salt which remains after the distillation of muriatic acid, two pounds;
Boiling water, two pints and a half.

Dissolve the salt in the water, and gradually add as much subcarbonate of soda as will saturate the excessive acid. Evaporate until a pellicle appear, and, after filtering the liquor, set it aside to crystallize. Pour off the liquor, and dry the crystals on blotting paper.

Dub.

Dissolve the salt, which remains after the distillation of muriatic acid, in a sufficient quantity of boiling water. Filter the solution, and after due evaporation crystallize the salt by slow refrigeration.

THE residuum of the process for preparing muriatic acid is an acidulous sulphate of soda, which is easily converted into a neutral sulphate by neutralizing or removing the acid in excess. The London College preserve the superabundant acid, by saturating it with carbonate of soda; the Edinburgh

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* *Syn.* Natrum sulphuricum crystallizatum, Deuto-sulphas sodii, Sal mirabile Glauberi, Sulphas natricus cum aqua depuratus.

College get rid of it by saturating it with carbonate of lime, with which it forms an insoluble sulphate of lime. In fact, the price of sulphate of soda is so very small, that it is no economy to use carbonate of soda to saturate the superabundant acid.

By far the greatest part of the sulphate of soda is obtained from manufacturers, as a result of processes performed for the sake of other substances, as in the preparation of muriate of ammonia, oxymuriatic acid, &c. It may be also economically obtained by making into a paste, with a sufficient quantity of water, eight parts of burnt gypsum, five of clay, and five of sea-salt. This mixture is burnt in a kiln or oven, then ground to powder, diffused in a sufficient quantity of water, and, after being strained, is evaporated until it will form crystals of sulphate of soda. The mother water contains muriate of lime, and alumine.

Sulphate of soda crystallizes in six-sided prisms, terminated by dihedral summits. The crystals are often irregular, and their sides are usually channelled. Their taste is at first salt, and afterwards disagreeably bitter. They are soluble in 2.67 parts of water at 60°, and in 0.8 at 212°. In the air they deaquesce and fall to powder. They undergo the watery fusion, and in a red heat melt. They consist of 40 sulphuric acid, 32 soda, and 90 water = 162; and when dried at 700°, of 40 acid, and 32 soda. It is decomposed by baryta and potass, and salts containing these bases, and by the salts of silver, mercury and lead.

Med. use.—Formerly this was the most common of the saline purgatives, but it has been in a great degree superseded by the sulphate of magnesia. Taken in doses of from half an ounce to an ounce or more, it proves a mild and useful purgative; and in smaller doses largely diluted, a serviceable aperient and diuretic. It is commonly given in solution, but it may also be given in powder, after it has deaquesced. In this form the dose must be reduced to one-half.

TARTRAS POTASSÆ ET SODÆ. *Ed.*

Tartrate of Potass and Soda.

Take of Subcarbonate of soda, one part;
Supertartrate of potass, three parts, or a sufficient quantity;
Boiling water, fifteen parts.

To the subcarbonate dissolved in the water, add the supertartrate in fine powder as long as it produces any effervescence, which commonly ceases before three times the weight of the subcarbonate be added. Then filter the liquor, after it is cold, through paper, and after due evaporation set it aside to crystallize.

Dub.

Take of Carbonate of soda, five parts;
Bitartrate of potass, in very fine powder, seven parts;
Boiling water, fifty parts.

Dissolve the carbonate of soda in the water, and gradually add the bitartrate of potass; filter the liquor through paper; evaporate, and set it aside to crystallize by slow cooling.

SODA TARTARIZATA.* *Lond.*

Tartarized Soda.

Take of Subcarbonate of soda, twenty ounces;
Supertartrate of potass, in powder, two pounds;
Boiling water, ten pints.

Dissolve the subcarbonate of soda in the water, and gradually add the supertartrate of potass. Filter the solution through paper; evaporate until a pellicle be formed, and set it aside to crystallize. Pour off the liquor, and dry the crystals on blotting paper.

THE tartaric acid, in several instances, is capable of entering into combination, at the same time, with two bases. In the present example, the second prime of acid of the bitartrate of potass is neutralized with soda, and, in place of a mixture of tartrate of potass and tartrate of soda, each possessing their own properties, there results a triple salt, having peculiar properties.

Mr Phillips found that 18 parts of subcarbonate of soda were sufficient to neutralize 24 of bitartrate of potass, which is conformable with the analysis of these salts. Dr Barker, in like manner, found that 10 parts of subcarbonate were neutralized by 14 of bitartrate. It would therefore appear that the Edinburgh College orders a great excess of crystals of tartar.

The tartrate of potass and soda forms large and very regular crystals, in the form of prisms with eight sides, nearly equal, which are often divided longitudinally, almost through their axis. It has a bitter taste. It is soluble in about five parts of water, and deaquesces in the air. It is decomposed by the strong acids, which combine with the soda, and separate supertartrate of potass, and by baryta and lime, which form insoluble tartrates. By heat its acid is destroyed. It consists of 14.25 tartrate of potass, and 12.25 tartrate of soda, with 9 water.

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* *Syn.* Tartarus natronatus, Sal polychrestus Seignette, Tartras kalico-natricus cum aqua, Tartras lixiviæ et sodæ, Tartris potassæ et sodæ, Deutotartras sodii, Tartras kalico-natricus.

Med. use.—It was introduced into medical practice by M. Seignette, an apothecary at Rochelle, whose name it long bore, and it is still very much employed as an excellent purgative salt. The dose is from six to ten drachms.

AQUA AMMONIÆ. *Ed.*

Water of Ammonia *.

Take of Muriate of ammonia, one pound;
Quicklime, fresh burnt, one pound and a half;
Distilled water, one pound;
Water, nine ounces.

Pour the water on the lime broken into bits, contained in an iron or earthen vessel, which is then to be covered up until the slaked lime cool. Then having previously ground the muriate into a very fine powder, mix it thoroughly with the lime, by triturating them together in a mortar, and immediately put the mixture into a glass retort. Place the retort in a sand-bath, and connect with it a receiver furnished with a tube which is to be inserted almost to the bottom of a phial, containing the distilled water. But the phial should be only half filled. The fire is now to be kindled, and gradually increased, until the bottom of the sand-pot begin to get red, and no more gas and liquor come over.

AMMONIÆ CAUSTICÆ AQUA. *Dub.*

Water of Caustic Ammonia.

Take of Muriate of ammonia, in powder, three parts;
Lime, fresh burnt, two parts;
Water, ten parts.

Sprinkle one part of the water upon the lime, placed in a stoneware vessel, and cover it up. Dissolve the salt in the rest of the water, heated. Pour the solution, after it has cooled, upon the slaked lime put into the retort after it has cooled. Draw off five parts by a moderate heat into a cooled receiver. The specific gravity of this liquor is 950 to 1000.

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* *Syn.* Liquor ammonii caustici, Ammonia pura liquida, Spiritus salis ammoniaci volatilis caustic. Ammoniac. caust.

LIQUOR AMMONIÆ. *Lond.*

Take of Muriate of ammonia, eight ounces;
Fresh lime, six ounces;
Water, four pints.

Pour a pint of the water upon the lime: then cover the vessel and set it aside for an hour; afterwards add the muriate of ammonia and the rest of the water previously heated to ebullition, and cover up the vessel again. Filter the liquor after it has cooled, and draw off by distillation twelve fluidounces of liquor of ammonia, into a receiver, whose temperature does not exceed 50°. The specific gravity of liquor of ammonia is to that of water as 0.960 to 1000.

In this process, the muriate of ammonia is decomposed by the lime, in consequence of its having a stronger affinity for muriatic acid than ammonia has; the ammonia is then either distilled off along with water, or is evolved in the form of gas, to be absorbed by water placed in the receiver.

It is absolutely necessary that the lime employed be very recently burnt, as the presence of carbonic acid would render the ammonia partially carbonated. The lime is slaked before it is mixed with the muriate of ammonia, in order that the heat generated during the slaking may not decompose the muriate, which is the case when they are mixed before adding the water. The proportion of lime to the sal ammoniac used by the colleges is very different, being as 6 to 4 by Edinburgh, 6 to 8 by London, and 6 to 9 by Dublin.

According to the scale of atomical equivalents, 28 parts only of lime are required for the decomposition of 54 of muriate of ammonia, or very little more than one half; but even the Dublin College allow 36 parts to compensate, according to Dr Barker, for the impurity of the quick lime as obtained from the kiln.

Mr Phillips, although he allows the process of the Edinburgh College to be more economical than that of the London, as 16 to 10, yet objects to it, that the quantity of lime is much too large, requiring large vessels; and that the mixture of the ingredients is a most pungent operation. Dr Hope admits that the odour is unquestionably pungent, but that it may be, in a great measure, avoided by adroitness; and contends that the excess of lime is in this instance particularly useful in accelerating the disengagement of the ammonia, and rendering a less elevation of temperature necessary. Mr Phillips, on repeating the process of the Edinburgh College, obtained an *aqua ammoniæ* of sp. gr. 0.936, and equivalent to 40.5 of strength; by the same process, with the lime reduced to two-thirds of the quantity ordered, or even in equal proportions, the mean strength was 40. This reduction he therefore considered a great improvement.

The addition of more water than exists in the slaked lime is essential to the existence of the ammonia in a liquid form under the pressure of the atmosphere; for in itself it is a permanently elastic fluid *; but the colleges differ both in the quantity added and the mode of conducting the process.

In the process directed in the Edinburgh Pharmacopœia, the ammonia is disengaged chiefly in the form of gas, and it is combined, by slight pressure in the condensing apparatus, with a quantity of water equal to three-fourths of the muriate of ammonia. The Dublin College uses ten parts of water to three of the salt, and the London eight parts to one. It is evident that this large quantity of water must require still larger vessels than the excess of lime ordered by the Edinburgh College.

The Edinburgh and Dublin Colleges introduce the whole lime prescribed into the retort, and as cold as possible, that little decomposition may take place until heat be applied. But the London process differs in adding the water hot, and filtering the materials after they have been mixed. Any undissolved lime is thus kept out of the retort, and the success of the process shews that the decomposition takes place before the distillation is performed, and that the filtered solution must contain muriate of lime and ammonia. At the same time it is not improbable that there is some loss of ammonia during the hot solution, and that the whole of the muriate may not be decomposed.

Although the Dublin College direct the whole of the water to be put into the retort along with the materials, yet Dr Barker advises a portion of it to be put into the receiver to absorb the gas, which comes over at the commencement

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* Ammonia gas consists of 1 volume of nitrogen and 3 of hydrogen condensed into 2; or of 3 parts of hydrogen and 14 of nitrogen by weight. It is transparent and colourless; elastic; sp. gr. 0.53125, air = 1; or 100 inches weigh 18.0035 grains; has a urinous and acrid odour, irritating the nostrils and eyes, and a caustic taste; is irrespirable; extinguishes flame; colours vegetable blues green; and is decomposed by being transmitted through a red-hot tube, and by the electric spark, into its constituent gases; and by oxygen and atmospheric air at a red heat; and by oxymuriatic acid (chlorine,) it is converted into water and nitrogen gas. It is absorbed without change by porous bodies; it dissolves sulphur and phosphorus, and combines readily with water in all its states. Water, at a mean temperature and pressure, is saturated by 670 times its volume of gaseous ammonia, is thereby increased in bulk, and acquires the specific gravity of 0.875. Mr Faraday, by subjecting ammoniacal gas to a pressure of about 6.5 atmospheres at 50° compressed it into a colourless limpid liquid of 0.760. Ammonia combines with all the acids, forming neutral salts, and with some of the oxides. It is formed during the putrefactive fermentation.

of the process in greater abundance. He also ascertained, that as the distillation proceeds, the solution contains less and less ammonia, so that it is unnecessary to draw off all the water added by the Dublin and London Colleges. He performed the operation with two parts of muriate of ammonia, one part of lime and twelve of water, and divided the product. The first three ounces had the *sp. gr.* 945 at 60°, the next ounce 975; the next 984, and the next ounce and a half 998.

What remains in the retort is muriate of lime, mixed with any excess of lime that may have been used, and a little ammonia not disengaged.

The different colleges have different methods of ascertaining when the process is complete. The Edinburgh, using no more water than is necessary to condense the gas, distil to dryness. The London draw off 12 floz. from 8 ounces of sal ammoniac, and the Dublin 5 parts from 3. The strength is therefore very different; the Edinburgh having a sp. gr. of 0.936, the Dublin of 950, and the London 0.960.

Table of the Quantities of Real or Gaseous Ammonia in solutions of different Specific Gravities. (Dalton.)

Specific Gravity.	Grains of ammonia in 100 water grain measures of liquid.	Grains of ammonia in 100 grains of liquid.	Boiling point of the liquid. Fahr. scale.	Volumes of gas condensed in a given vol. of liquid.
.85	30	35.3	26°	494
.86	28	32.6	38	456
.87	26	29.9	50	419
.88	24	27.3	62	382
.89	22	24.7	74	346
.90	20	22.2	86	311
.91	18	19.8	98	277
.92	16	17.4	100	244
.93	14	15.1	122	211
.94	12	12.8	134	180
.95	10	10.5	146	147
.96	8	8.3	158	116
.97	6	6.2	173	87
.98	4	4.1	187	57
.99	2	2.	196	28

Sir Humphry Davy's results were somewhat different. He found 100 parts of sp. gr. 0.875, to contain 32.5 of ammonia; of sp. gr. 0.9054, 25.37; and of sp. gr. 0.9692, 9.5 of ammonia.

Liquid ammonia is perfectly limpid and colourless, very volatile; has a pungent urinous smell, and a caustic urinous taste. It forms a white soapy liniment when mixed with fixed oil.

Water of ammonia decomposes many of the earthy, and all the metalline salts, and is capable of dissolving, or combining with, many of the metalline oxides, and even causing the oxidation of some of the metals. When pure, water of ammonia does not effervesce with any of the acids, or form a precipitate with lime water or alcohol. As it readily absorbs carbonic acid from the atmosphere, the Edinburgh College order it to be kept in small phials. By neglecting this precaution in the shops, it often becomes carbonated before the large bottles, in which it is commonly kept, be expended.

Med. use.—Water of caustic ammonia is very rarely given internally, although it may be used in doses of ten to twenty drops largely diluted, as a powerful stimulant in asphyxia, and similar diseases. Externally, it is applied to the skin as a rubefacient, or vesicant, and, in the form of gas, to the nostrils, and to the eyes, as a stimulant in cases of torpor, paralysis, rheumatism, syncope, hysteria, and chronic ophthalmia.

Off. Prep.—Ammoniæ hydrosulphuretum, *D. E.* Linimentum ammoniæ, *D. L.* Oleum ammoniat. *E.* Liniment. camph. comp. *D. L.* Hydrargyri submurias ammoniatum, *D.* Calcis phosphas præcipit. *D.* Liniment. hydrargyri, *L.*

AQUA AMMONIÆ DILUTA. *Ed.*
Diluted Water of Ammonia.

Take of Water of ammonia, one part;
Distilled water, two parts.
Mix them.

THIS formula for preparing a diluted solution of ammonia is absolutely necessary; for water of ammonia of the strength obtained by following the direction of the Edinburgh College is perfectly unmanageable, and in fact is never dispensed by the apothecaries, who have always been in the practice of substituting, (and it is well they did so,) for water of ammonia, when prescribed, a form of it diluted according to their own judgment.

ALCOHOL AMMONIATUM. *Ed.*
Ammoniated Alcohol *.

Take of Stronger alcohol, thirty-two ounces;
Fresh lime, twelve ounces;

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* *Syn.* Spiritus salis ammoniaci, Alcoolatum ammoniacale.

Muriate of ammonia, eight ounces;
Water, six ounces.

Pour the water on the pounded lime in an iron or earthenware vessel; cover the vessel until the lime fall to powder; then mix the muriate in very fine powder with the lime, by rubbing them together in a mortar, and immediately introduce them into a glass retort. Place the retort in a sand-bath, and fit on closely a receiver, furnished with a tube which passes to the bottom of a bottle containing the alcohol, but large enough to hold forty-eight ounces. Lastly, apply heat, to be gradually increased, until the bottom of the iron-pot become red, and continue it as long as gas and fluid come over.

SPIRITUS AMMONIÆ. *Dub.*

Spirit of Ammonia.

Take of Rectified spirit, three pints;
Carbonate of ammonia, in coarse powder, three ounces and a half.

Mix, and dissolve the salt with a moderate heat, then filter the liquor.

Lond.

Take of Proof-spirit, three pints;
Muriate of ammonia, four ounces;
Subcarbonate of potass, six ounces.

Mix, and draw off, with a gentle heat, a pint and a half into a cooled receiver.

THE processes here described yield products considerably different. In that of the Edinburgh College, ammoniacal gas is disengaged by the decomposition of muriate of ammonia, and absorbed to saturation by rectified spirit. In short, it is a perfect solution of caustic ammonia gas in alcohol, and a most powerful agent both on the animal economy and as a chemical solvent.

The processes of the London and Dublin Colleges yield a variable solution of carbonate and sesquicarbonate of ammonia in spirit.

The process of the Dublin College is a mere solution; but I should have doubted the success of the process, if Dr Barker had not found rectified spirit of 836 at 68°, on application of heat, dissolve it, with extrication of carbonic acid gas. The solution rendered lime water turbid, and therefore contained some carbonic acid.

In the process of the London College, carbonate of ammonia is formed by decomposition, and rises along with the spirit; and as diluted alcohol is employed by the college, and one-half only is drawn off, it is evident that there is either a want of economy, or the whole alcohol comes over before any of the water. But if the latter supposition be true, there is also a want of economy; for the alcohol will dissolve, besides the ammonia, very little of the carbonate. I have found by trial, that when we perform this process exactly, a very large proportion of carbonate of ammonia sublimes, which remains undissolved in the distilled liquor; but as this liquor (after the particles of carbonate of ammonia which were diffused through it have separated in the form of very regular crystals, adhering to the sides of the vessel) effervesces with acids, the distilled liquor cannot be pure alcohol, but must contain a proportion of water capable of dissolving some carbonate of ammonia. In fact, the product is unfit for the preparation of the aromatic ammoniated alcohol, as it will not dissolve the volatile oils.

Mr Phillips found, that when the spirit of ammonia was prepared by the process 1809, by mixing two parts of alcohol with liq. am. of 0.914, the saturating power of a fluidounce as an alkali was equal to 95 grains of marble; whereas, by the potash process, its saturating power = 32 grains of marble; the former being three times as great as the latter, besides being caustic instead of subcarbonated.

Med. use.—It is a most pungent diffusible stimulant, and must be exhibited internally, with great caution and much diluted. Externally it is a powerful rubefacient. When prepared of the strength directed by the Edinburgh College, and saturated with camphor, it forms the most stimulating liniment we possess.

Off. Prep.—Tinctura aromatica ammoniata, *E. D.* Tinctura assæfœtidæ ammoniata, *E. L. D.* Tinctura castorei ammoniata, *E.* Tinctura guaiaci ammon. *E.* Tinctura opii ammoniata, *E.* Tinctura valerianæ ammoniata, *E. D.*

SUBCARBONAS AMMONIÆ. *Ed.*

Carbonate of Ammonia *.

Take of Muriate of ammonia, one part;
Soft carbonate of lime, dried, two parts.

Having triturated them separately, mix them thoroughly, and sublime from a retort into a refrigerated receiver.

Lond.

Take of Muriate of ammonia, one pound;
Prepared chalk, dried, one pound and a half.

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* Ammonium carbonicum, Carbonis ammon. alkalinus, Carbonas ammon. alkal. solidum, Sal alkali volatile, Subcarbonas ammoniacus.

Triturate them separately, then mix and sublime them with a gradually increased heat, until the retort become red.

AMMONIÆ CARBONAS. *Dub.*
Carbonate of Ammonia.

Take of Muriate of ammonia, in powder, and well dried,
Dried carbonate of soda, of each, one part;
Mix them, put them into an earthen retort, and sublime the carbonate of ammonia, with a heat gradually raised, into a cooled receiver.

In this process the two substances employed undergo a mutual decomposition, the muriatic acid combining with the lime or the soda, and the carbonic acid with the ammonia. The proportion of carbonate of lime directed by the Edinburgh College is more than sufficient to decompose the muriate of ammonia, which is only inconvenient, from obliging us to make use of larger vessels, and perhaps uneconomical, from requiring more fuel; whereas, if any portion of the muriate of ammonia were to remain undecomposed, it would sublime along with the carbonate, and render the product impure. By calculation 50 of carbonate of lime are sufficient to decompose 54 muriate of ammonia, and Mr Phillips thinks that one proportion and a half of chalk would be amply sufficient. Göttling uses three parts of dried chalk to two of muriate of ammonia. The ingredients are to be thoroughly mixed by trituration, before they are introduced into the retort, that no part of the muriate of ammonia may escape decomposition. Carbonate of lime does not act on muriate of ammonia till a considerable heat be applied. Göttling says, that the sublimation must be conducted in the open fire, and therefore he uses an earthenware cucurbit, with a tubulated capital. When a glass retort is employed, it should have a very wide neck; and the best form for the receiver is cylindrical, as it enables us to get out the carbonate of ammonia condensed in it without breaking it. The residuum which remains in the retort is chloride of calcium.

By the Dublin College, dried carbonate of soda is employed for the preparation of carbonate of ammonia. The theory of the process is the same, and the decomposition is effected at a lower temperature. MM. Chevallier and Idt say that the proportion of carbonate of soda used in the process of the Dublin College to decompose the muriate of ammonia is too small, and that a portion of the ammonia is disengaged in a caustic state, which may be condensed in water. When soda is used the residuum is chloride of sodium, or contains muriate of soda.

Carbonate of ammonia is obtained in the form of a white crystallized mass, of a fibrous texture, having the smell and taste of ammonia, but weaker. It is soluble in twice its weight of cold water; Mr Phillips says four times; its solubility is increased by increase of temperature; but when dissolved in boiling water, it loses a portion of its ammonia with effervescence. According to Dr Barker, it is abundantly soluble in proof spirit, and partially in rectified spirit. It is said to vary very much in its composition, and to contain more ammonia, and less acid and water, in proportion to the high temperature employed in preparing it; the quantity of alkali varying from 50 to 20 *per cent.* Dr Thomson says that he has never met in commerce with a saturated carbonate ammonia, and that even the freshest was in a state of sesquicarbonate, or 1 prime of ammonia with $1\frac{1}{2}$ carbonic acid. Even this, by keeping, soon loses ammonia, and becomes a bicarbonate, which is characterized by its having no pungent odour.

It is decomposed by most of the acids, and all the alkaline and some of the earthy bases; by the earthy sulphates, except those of baryta and strontia; by the earthy muriates and fluates; by the nitrates of baryta, and superphosphate of lime.

Med. use.—Carbonate of ammonia exactly resembles ammonia in its action on the living body; but is weaker, and is principally used as smelling salts in syncope and hysteria. On the continent it is given as an emetic.

Off. Prep.—Ammoniæ carbonatis aqua, *D. L. E.* Ammon. acetatis aqua, *D. L. E.* Ammoniæ bicarbonas, *D.* Cuprum ammoniatum, *D. L. E.* Spiritus ammoniæ, *D.*

SOLUTIO SUBCARBONATIS AMMONIÆ. *Ed.*

Solution of Subcarbonate of Ammonia *.

Take of Subcarbonate of ammonia, one part;
Distilled water, four parts.

Dissolve the subcarbonate in the water, and filter through paper.

LIQUOR AMMONIÆ SUBCARBONATIS. *Lond.*

Liquor of Subcarbonate of Ammonia.

Take of Subcarbonate of ammonia, four ounces;
Distilled water, a pint.

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* *Syn.* Liquor ammonii carbonici aquosus, Liq. amm. subcarb. aquos. Carbonas ammoniæ alkalinus solutus, Carbonas ammoniæ alcalinum liquidum, Spiritus salis ammoniaci aquosus, Subcarbonas ammoniæ liquidus.

Dissolve the subcarbonate of ammonia in the water, and filter through paper.

AMMONIÆ CARBONATIS AQUA. *Dub.*

Water of Carbonate of Ammonia.

Take of Carbonate of ammonia, four parts;
Distilled water, fifteen parts.

Dissolve the carbonate of ammonia in the water, and filter through paper. Its sp. gr. is 1090.

IN making this solution, the water must be used cold, as the salt is decomposed by hot water.

Med. use.—Its action is the same as that of the salt. The dose from half a drachm to two drachms.

Off. Prep.—Bicarbonas ammoniæ, *D.*

AMMONIÆ BICARBONAS. *Dub.*

Bicarbonate of Ammonia *.

Take of Water of carbonate of ammonia, any quantity.

Expose it, in a proper apparatus, to a stream of carbonic acid gas evolved during the solution of white marble, in dilute muriatic acid, until the alkali be saturated. Then let it rest to form crystals, which are to be dried without heat, and kept in a close vessel.

THIS salt is now for the first time made officinal by the Dublin Pharmacopœia. The mode of preparation requires no observation, except that its success is much assisted by pressure. Its constitution is one equivalent of ammonia, 17, two of carbonic acid, 44, and one of water, 9=70. Its crystals are of considerable size. It requires eight times its weight of water for its solution. It is much less pungent and ammoniacal both in smell and taste, and more permanent in the air. Its solution should cause no precipitation in a solution of sulphate of magnesia.

Med. use.—Dr Barker considers it as a valuable improvement in pharmacy, as enabling us to prescribe ammonia more freely, in a form convenient and palatable. It is diaphoretic, antipasmodic and antacid. Its dose is from six to twenty-four grains, and it should be dissolved in cold water.

AQUA ACETATIS AMMONIÆ. *Ed.*

Water of Acetate of Ammonia †.

Take of Subcarbonate of ammonia in powder, any quantity;
Dilute acetic acid, a sufficient quantity.

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* *Syn.* Supercarbonas ammoniæ.

† *Syn.* Liquor ammonii acetici, Acetas ammoniæ solutus, Acetas ammoniæ liquida, Spiritus Mindereri, Solutio acetatis ammoniaci.

Add the acid gradually, until the subcarbonate is accurately saturated.

Dub.

Take of Carbonate of ammonia, one part.

Add gradually, with frequent agitation, of distilled vinegar, as much as will saturate the ammonia, or about thirty parts, as proved by the test of litmus.

LIQUOR AMMONIÆ ACETATIS. *Lond.*

Solution of Acetate of Ammonia.

Take of Carbonate of ammonia, two ounces;
Acetic acid, four pints, or what may be required.

Add the acid to the carbonate of ammonia until the effervescence cease, and mix.

In this process the acetic acid combines with the ammonia, and the carbonic acid is expelled with effervescence. The exact point of saturation should be ascertained by the alternate use of litmus and turmeric papers. The acetate of ammonia is dissolved in the water of the acetic acid; but as this is apt to vary in quantity, the solution also varies in strength; and as the carbonate of ammonia varies in its proportion of ammonia, the quantity necessary for saturation is uncertain. A pint of distilled vinegar, of sp. gr. 1007, was, according to Dr A. T. Thomson, saturated by 320 grains of carbonate of ammonia; by Mr Brande, acid of sp. gr. 1009 was saturated by 105 grains; and by Dr Barker, acid of 1005 by 280, and the liquor acquired the sp. gr. of 1011.

This saline fluid should be transparent and colourless, and should be neutral or very slightly acid. It is decomposed by the acids, alkalies, and several of the earths and metalline salts; and when in solution, its acid is decomposed spontaneously, and by heat.

The acetate of ammonia formerly used was what was called *Spiritus Mindereri*, to make which, the subcarbonate of ammonia derived from hartshorn, and which was still impregnated with animal oil, was employed. The liquor then contained a kind of ammoniacal soap, which does not exist in the acetate of ammonia as now prepared.

Med. use.—Acetate of ammonia in solution, when assisted by a warm regimen, has a determination to the surface, and proves an excellent and powerful sudorific; and from its mode of operation, it is admissible in febrile and inflammatory diseases, in which the use of more stimulating sudorifics is attended with danger. Its action may likewise be determined to the kidneys, by walking about in a cool air.

The common dose is half an ounce, either by itself or in combination with other substances.

M. Masuyer has proposed recently the acetate of ammonia as a means of dissipating drunkenness, and also headachs, by putting twenty-five drops of it into a glass of sweetened water.

CHAP. IV.—EARTHS AND EARTHY SALTS.

MURIAS BARYTÆ. *Ed.*

Muriate of Baryta [*].

1st Process.

Take of Carbonate of baryta,
Muriatic acid, of each one part;
Water, three parts.

Add the carbonate, broken into little bits, to the water and acid previously mixed. After the effervescence has ceased, digest for an hour, strain the liquor, and, after due evaporation, set it aside to crystallize. Repeat the evaporation as long as any crystals are formed.

2d Process.

If the carbonate of baryta cannot be procured, the muriate may be prepared in the following manner from the sulphate:

Take of Sulphate of baryta, two pounds;
Charcoal of wood, in powder, four ounces;
Muriatic acid, a sufficient quantity.

Roast the sulphate, that it may be more easily reduced to a very fine powder, with which the powdered charcoal is to be intimately mixed. Put the mixture into a crucible, and having fitted it with a cover, heat it with a strong fire for six hours. Then triturate the matter well, and throw it into six pounds of boiling water in an earthen or glass vessel, and mix them by agitation, preventing as much as possible the action of the air. Let the vessel stand in a vapour bath until the part not dissolved shall subside, then pour off the liquor. On the undissolved part pour four pounds more of boiling water, which, after agitation and deposition, are to be added to the former liquor. Into the liquor, when still warm, or, if it shall have cooled, again heated, drop muriatic acid as long as it excites any effervescence. Then strain the liquor, and evaporate it so as to crystallize.

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[*] *Syn.* **Baryta muriatica, Murias baryticus, Terra ponderosa salita, Chloruretum barii, Chloridum barii.**

Dub.

Take of Sulphate of baryta, ten parts;
Wood charcoal in very fine powder, or wood soot, one part.

Roast the sulphate of baryta, and throw it while still red into cold water; then rub it to very fine powder in the manner directed for the preparation of chalk. Mix the powders intimately, put them into a crucible, and heat them on a strong fire for four hours. Dissolve the mass, when cold, in water equal to ten times the weight of the sulphate of baryta, and filter the solution. Add to this, avoiding the vapour, as much muriatic acid as will saturate the baryta. Then filter the liquor, and crystallize by evaporation and refrigeration.

THE first process of the Edinburgh College is an instance of simple solution, with disengagement of the carbonic acid while the baryta is dissolved by the muriatic acid, from which crystals are got by the common processes of evaporation and rest. But as carbonate of baryta is a rare mineral, the muriate is commonly prepared from the sulphate, which is very common. The sulphate may be rendered soluble, by compound affinity, by means of carbonate of potass or muriate of lime; or by decomposing the sulphuric acid by means of charcoal. This is the mode directed by the Edinburgh and Dublin Colleges.

At a high temperature charcoal has a greater affinity for oxygen than either sulphur or baryta has; it therefore decomposes both the sulphuric acid and baryta, by depriving them of oxygen, and flies off in the state of carbonic oxide or acid gas, while the sulphur combines with the reduced barium. On adding water to the sulphuret of barium thus formed, new combinations take place. A portion of sulphate of baryta is regenerated, while hydro-sulphuret of baryta remains in solution. This solution is exceedingly prone to decomposition, and must therefore be preserved from the action of the air as much as possible. Sulphuret of barium is much more soluble in hot than in cold water, and therefore the Edinburgh College, who use little water for making the solution, that less subsequent evaporation may be necessary, direct the solution to be kept hot until the muriatic acid be added. But the Dublin College, which uses a much larger quantity of water, direct the solution to be made cold. On the addition of muriatic acid, there is a violent effervescence and disengagement of sulphuretted hydrogen gas, while very pure muriate of baryta remains in solution. When prepared in this way, it cannot be contaminated with any of the noxious metals, as their compounds with sulphur and hydrogen are not soluble.

Muriate of baryta crystallizes by evaporation commonly in tables. Its crystals are permanent; and by the action of heat decrepitate, dry, and melt. It has a disagreeable bitter taste; is soluble in three parts of water at 60°, and in less than twice its weight of boiling water. It is scarcely soluble in alcohol; and its solution burns with a yellow flame. It crystallizes by evaporation. When crystallized, it contains acid 37, baryta 78; when dried, 36 chlorine, and 70 barium. It is decomposed by the sulphates, nitrates, succinates, oxalates, tartrates, and sulphites; and by the alkaline phosphates, borates, and carbonates, and their acids. It is also decomposed by succinate of ammonia, nitrate of silver, acetate, nitrate and phosphate of mercury, acetate of lead, tartrates of iron and antimony, burnt sponge, and Hermbstadt's antimonial tincture, antimonial wine, soap, &c., extracts of gentian, marsh trefoil, and the inspissated juices of aconite, hemlock and hyoscyamus. It is not decomposed by muriate of iron, or corrosive sublimate, and bears the addition of aromatic distilled waters, simple syrups, gum arabic mucilage, some simple extracts, pure opium, and similar substances, when they do not contain astringent matter.

When pure it has no colour; does not deliquesce; does not burn with a red or purple flame, when dissolved in alcohol; and is not precipitated by gallic acid, prussiate of potass and iron, or hydro-sulphuret of ammonia. By washing with alcohol muriate of baryta, rendered impure by the presence of muriate of iron, the latter alone is dissolved.

It is always given in solution.

Off. Prep.—Solutio muriatis barytæ, *E. D.*

SOLUTIO MURIATIS BARYTÆ, *Ed.*
Solution of Muriate of Baryta [*].

Take of Muriate of baryta, one part;
Distilled water, three parts. Dissolve.

BARYTA MURIATIS AQUA. *Dub.*
Water of Muriate of Baryta.

Take of Muriate of baryta, one part;
Distilled water, three parts. Dissolve.
Its sp. gr. is 1230.

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[*] *Syn.* Solutio barytis muriatici.

For making this preparation, the crystals should be used entire; for when they are previously powdered, the solution always turns out turbid. Its solution is very rarely saturated, and the quantity of water prescribed is sufficient, even at the lowest ordinary temperatures; a circumstance which should be attended to in making saturated solutions of saline bodies. As it is of great importance, that the strength of so active a substance should be uniform, a knowledge of its sp. gr. is useful, as by the addition of more of the salt or of water, any inequality of the solution may be easily corrected.

Med. use.—Muriate of baryta is generally said, by writers on the materia medica, to be a *stimulant* deobstruent; and yet Hufeland, one of its greatest panegyrists, says that it succeeds better in cases attended with inflammation and increased irritability than with atony and torpor. When given in large doses, it certainly produces nausea, vomiting, diarrhœa, vertigo, and death.

Its effects on a morbid state of the body are also disputed. Some assert that it is of no advantage in any disease; while others bestow upon it the most unqualified praises. By the latter it is principally celebrated in all cases of scrofula, in obstructions and tumours, in cases of worms, and in cutaneous diseases.

The dose of the solution, at first, is five or ten drops twice or thrice a-day, to be gradually and cautiously increased to as much as the patient can bear.

The solution is also used externally as a stimulating and gently escharotic application in cutaneous diseases, fungous ulcers, and specks upon the cornea.

CALX. *Lond.*
Lime[*].

Take of White marble, one pound.

Break it into bits, and burn it for an hour in a crucible with a violent heat, or until the carbonic acid be totally expelled, so that on dropping on it dilute acetic acid, no air bubbles are formed.

CALX E TESTIS. *Lond.*
Oyster-shell lime.

Lime may be made in the same manner from *oyster-shells.*

LIME is not found in nature, but it is easily procured by the action of fire from any of the abundant carbonates, mineral or animal. For most purposes common lime will do; but as it is seldom pure or totally deprived of its carbonic acid, it may be necessary for the chemist to prepare it himself. Clean oyster-shells afford it in the greatest purity; and as pure lime is not altered by any heat that can be applied, there is no risk of pushing the fire too far. White marble also furnishes a very pure lime. Lime rapidly absorbs water and carbonic acid, and must therefore be kept in small well-corked and sealed bottles.

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[*] *Syn.* Calcaria usta, Calx viva.

SOLUTIO CALCIS sive AQUA CALCIS. *Ed.*
Solution of Lime or *Lime Water* *.

Take of Fresh burnt lime, half a pound.

Put it into an earthen vessel, and sprinkle on it four ounces of water, keeping the vessel covered, while the lime grows hot, and falls into powder. Then pour on it twelve pounds of water, and mix the lime thoroughly with the water by agitation. After the lime has subsided, repeat the agitation, and let this be done about ten times, always keeping the vessel covered, that the free access of the air may be prevented. Lastly, let the water be filtered through paper, with glass rods interposed between it and the funnel, that the solution may pass as quickly as possible. It must be kept in very close bottles.

AQUA CALCIS. *Dub.*
Lime Water.

Take of Lime recently burnt,
Boiling water, of each one part.

Put the lime into an earthen vessel, and sprinkle the water upon it, keeping the vessel shut while the lime grows warm and falls into powder; then pour upon it thirty parts of cold water, close the vessel, and agitate the mixture frequently for twenty-four hours; lastly, after the (undissolved) lime has subsided, pour off the limpid solution, and keep it in well-closed bottles.

LIQUOR CALCIS. *Lond.*
Solution of Lime.

Take of Lime, half a pound;
Boiling distilled water, twelve pints.

Pour the water on the lime, and stir them together; immediately cover the vessel, and set it aside for three hours; then preserve the liquor upon the remaining lime in well-corked bottles, and decant off the limpid solution when wanted for use.

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* *Syn.* Aqua calcariæ.

LIME-WATER is made in two ways. The more common, that of the Edinburgh and Dublin Colleges, is to add at first only so much water as is sufficient to slake the lime, which reduces it to a fine powder, easily diffused through water; and then to dissolve the slaked lime in water.

The London College, without previously slaking the lime, pour on the whole quantity of water at once. During the whole process, the air must be excluded as much as possible, as lime-water has a very strong affinity for carbonic acid, and attracts it from the atmosphere. The proportion of water used is scarcely able to dissolve one-tenth of the lime; but lime is of little value; and our object is to form a saturated solution quickly and easily. Lime is actually more soluble in cold water than in hot: therefore it is unnecessary and inconvenient to use boiling water. The Edinburgh College filters its solution; and if we use the precautions directed, it may be performed without the lime absorbing a perceptible quantity of carbonic acid.

The London and Dublin Colleges do not filter, but decant off their solution, and if carefully performed it will be perfectly pure. The directions given by the London College, of keeping the lime-water upon an excess of lime, is certainly an advantage, as we are sure of its being always saturated; for fresh lime will be always dissolved to supply the place of that rendered insoluble, and precipitated by the absorption of carbonic acid. The bottles in which the lime-water is kept should be perfectly full and well corked.

M. Descroizilles is said to have observed that quicklime retains from six to seven *per cent.* of potass, arising from the combustible used in its calcination, so that we must admit two kinds of lime-water; first, lime-water which, besides the lime, retains a small portion of potass; and secondly, lime-water prepared by pouring water on the residuum of the first solution. As potass is more soluble than the lime, the first lime-water possesses more energy, and M. Planche has proposed giving it the name of *eau de chaux potassé.* This observation must refer only to lime burnt with wood, and cannot be correct of limestone burnt with coal, and still less of shells burnt in a crucible.

Lime-water is transparent and colourless. It has an austere acrid taste, and affects vegetable colours as the alkalies do. Good lime-water is precipitated white by alkaline subcarbonates, and orange by corrosive sublimate. It enters very readily into combination with all the acids, sulphur, and phosphorus, and decomposes the alkaline carbonates, phosphates, fluates, borates, oxalates, tartrates, and citrates, the ammoniacal acetates, muriates and succinates, the sulphates of alumina and magnesia, the metallic salts, spiritous liquors, and astringent substances.

Med. use.—When applied to the living fibre, lime-water corrugates and shortens it; it therefore possesses astringent powers. It is also a powerful antacid, or at least it combines with, and neutralizes acids when it comes in contact with them. It also dissolves mucus, and kills intestinal worms. From possessing these properties, it is used in medicine, in diseases supposed to arise from laxity and debility of the solids, as diarrhœa, diabetes, leucorrhœa, scrofula, and scurvy; in affections of the stomach accompanied with acidity and flatulence; when the intestines are loaded with mucus; and in worms. Mr Stephen's celebrated remedy for stone in the bladder consisted of lime-water taken along with a solution of soap. In former editions I denied the power of lime-water as a lithontriptic; but the French translators have taken a different view of the subject, and quote Professor Laugier as having shewn that urate of lime is more soluble than uric acid, and observe, that lime-water may also act by disaggregating the calculus, in consequence of its action upon the connecting mucus. The same view was long ago communicated to me by the late Dr John Murray. It has been also recommended in porrigo larvalis, in cancer, and in chronic cutaneous diseases. Externally, it is applied to ill-conditioned ulcers, gangrenous sores, as a wash in porrigo capitis and scabies; and as an injection in gonorrhœa, fistulas, and ulcers of the bladder.

When taken internally, its taste is best covered by lukewarm milk. Its dose is commonly from two to four ounces, frequently repeated; but when long continued, it weakens the organs of digestion.

Off. Prep.—Aqua calcis comp. *D.* Infusum sarsaparillæ comp. *D.* Linimentum calcis, *D. E.*

CARBONAS CALCIS PRÆPARATUS. *Ed.*

Prepared Carbonate of Lime *.

Carbonate of lime, after having been triturated to powder in an iron mortar, and levigated on a porphyry stone with a little water, is to be put into a large vessel, and water to be poured upon it, which, after agitating the vessel repeatedly, is to be decanted off, while loaded with minute powder. On allowing the water to settle, the subtile powder will subside, which is to be dried.

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* *Syn.* Creta depurata, Carbonas calcis depuratus, Calcaria subcarbonica.

The coarse powder which the water could not suspend may be levigated again, and treated in the same manner.

CRETA PRÆPARATA. *Dub.*
Prepared Chalk.

Take of Chalk any quantity. Grind it to powder in an earthen-ware mortar, with the addition of a little water; then mix it with a sufficiently large quantity of water by agitation: and after allowing it to stand a little, until the coarser particles fall to the bottom, pour off the liquor. This may be several times repeated, after previous trituration. Finally, collect the very fine powder, which, after some time, will subside in the decanted liquor, and dry it upon a bibulous stone or paper.

Lond.

Take of Chalk, one pound.

Add a little water to the chalk, and triturate it to fine powder. Throw this into a large vessel filled with water, then agitate them, and after a short pause decant off the supernatant liquid, still turbid, into another vessel, and set it aside, that the powder may subside. Lastly, having poured off the water, dry this powder.

TESTÆ PREPARATÆ. *Lond.*
Prepared Oyster Shells.

Wash, in boiling water, the shells previously well cleansed, then prepare them in the same manner as chalk is prepared.

THE preparation of these substances merely consists in reducing them to an impalpable powder, by the processes of levigation and elutriation.

Med. use.—Carbonate of lime is commonly called an absorbent earth. It certainly is an antacid; that is, it combines with and neutralizes most acids, while its carbonic acid is expelled in the form of gas. It is therefore exhibited in affections of the stomach accompanied with acidity, especially when at the same time there is a tendency to diarrhœa. The fear of its forming concretions in the bowels is probably imaginary; for it is not warranted either by theory or experience.

Applied externally, carbonate of lime may be considered as an absorbent in another point of view; for its beneficial action on burns and ulcers probably arises entirely from its imbibing the moisture or ichorous matter, as a sponge would do, and thus preventing it from acting on the abraded surfaces, and excoriating the neighbouring parts.

Off. Prep.—Acidum citricum, *D. L.* Acidum tartaricum, *D. L.* Confectio aromatica, *D.* Pulvis cretæ comp. *D. L.* Mistura cretæ, *D. L.* Hydrargyrum cum creta, *L.*

Off. Prep. of prepared shells.—Confectio aromatica, *L.*

CALCIS CARBONAS PRÆCIPITATUM. *Dub.*

Precipitated Carbonate of Lime.

Take of Water of muriate of lime, five parts.

Add three parts of carbonate of soda, dissolved in four times its weight of distilled water. Wash the matter which falls to the bottom, three times, by pouring on, each time, a sufficient quantity of water. Lastly, having collected it, dry it upon a chalk-stone or paper.

THIS preparation affords carbonate of lime in its purest state, and, although expensive, may be employed when it is intended for internal use. By calculation 144 of crystallized subcarbonate of soda decompose 65 dry muriate of lime.

Off. Prep.—Hydrargyrum cum creta, *D.*

CALCIS MURIAS. *Dub.*

Muriate of Lime *.

Take of the Liquor which remains after the distillation of muriatic acid, any quantity. Filter it, and expose it to the action of heat in an open vessel, until the muriate of lime is rendered perfectly dry. Keep it in very close vessels.

Lond.

Take of the Salt which remains after the distillation of the subcarbonate of ammonia, two pounds;
Water, one pint.

Dissolve and filter through paper. Evaporate the liquor until the salt be rendered dry. Keep this in a well-closed phial.

SOLUTIO MURIATIS CALCIS. *Ed.*

Solution of Muriate of Lime.

Take of Hard carbonate of lime, that is, white marble, broken into pieces, nine ounces;

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* *Syn.* Calcaria muriatica, Murias calcicum, Murias calc oxygenatum, Sal ammoniacum fixum.

Muriatic acid, sixteen ounces;
Water, eight ounces.

Mix the acid with the water, and gradually add the pieces of carbonate of lime. When the effervescence has ceased, digest them for an hour, pour off the liquor and evaporate it to dryness. Dissolve the residuum in its weight and a half of water, and, lastly, filter the solution.

LIQUOR CALCIS MURIATIS. *Lond.*
Liquor of Muriate of Lime.

Take of Muriate of lime, two ounces;
Distilled water, three fluidounces.

Dissolve the muriate of lime in the water, then filter through paper.

CALCIS MURIATIS AQUA. *Dub.*
Water of Muriate of Lime.

Take of Muriate of lime, two parts;
Distilled water, seven parts.

Dissolve. Its sp. gr. is 1202.

CHLORIDE of calcium, or muriate of lime, is economically prepared from the residuum in the decomposition of muriate of ammonia, by lime or chalk, by watery fusion, solution, filtration, and evaporation. Its purity is ascertained by its remaining colourless and transparent, with infusion of galls and caustic ammonia; a brown colour indicating the presence of iron, and a precipitation that of alumina. But it may be purified by boiling it in solution, with a sufficient quantity of pure chalk, or other carbonate of lime, filtrating it, evaporating it gently, till it acquire the specific gravity of 1.5, allowing it to stand some days in a corked bottle, decanting it carefully from the sediment, and duly evaporating it. The chloride of calcium is also obtained by the direct action of muriatic acid on carbonate of lime.

The crystals of this salt are prisms of six smooth and equal sides, but they are often so aggregated, that they can only be termed acicular. Its taste is pungent, bitter, and disagreeable. When heated, it melts, swells, and loses its water of crystallization. It is very deliquescent, and is so soluble, that water seems capable of dissolving twice its weight, or, at least, forms with it a viscid liquor; but as it is still capable of attracting moisture from the air, and of emitting caloric, when farther diluted, it can scarcely be considered as a true solution. It is also soluble in an equal weight of boiling alcohol, and its solution burns with a crimson flame. It is decomposed by the sulphuric, nitric, oxalic, tartaric, succinic, phosphoric, fluoric, and boracic acids; by baryta, potass, soda, and strontia; by carbonated, sulphated, phosphated, tartrated, acetated alkalies; superoxalate of potass, sub-borate of soda, boro-tartrate of potass and soda, tartrate of potass and soda, succinate of ammonia, alum, sulphate of magnesia, nitrate of silver, nitrate, phosphate, and acetate of mercury, acetate of lead, and sulphate of iron, copper and zinc. Crystallized, it contains 37 acid, 28 lime, and 54 water, = 119; dried at a red heat, 36 chlorine, and 20 calcium, = 56.

Med. use.—It was first proposed as a medicine by Fourcroy, and has been since extolled in scrofulous and glandular diseases, and cases of debility in general, by several eminent practitioners of our own country, Dr Beddoes, Dr R. Pearson, and Dr Wood. Thirty drops of the solution are a sufficient dose for children, and a drachm for adults, repeated twice or thrice a-day. In an over-dose, it has produced qualms and sickness; and three drachms and a half killed a dog, the stomach of which, upon dissection, had its villous coat bloodshot, and in many parts almost black, and converted into a gelatinous slime. The property of this salt, of producing intense cold during its solution, might also be applied to medical use.

Off. Prep. of the muriate of lime.—Solutio muriatis calcis, *E. L. D.* Alcohol, *D.*

——— *of the solution.*—Calcis carbonas præcipitatum, *D.*

CORNU USTUM. *Lond.*

Burnt Horn *.

Burn pieces of horn in the open fire, until they become perfectly white; then reduce them to powder, and prepare it in the same manner as is directed for chalk.

PULVIS CORNU CERVINI USTI. *Dub.*

Powder of Burnt Hartshorn.

Burn pieces of hartshorn till they become white; then reduce them to a very fine powder.

THE pieces of horn generally employed in this operation are those left after the distillation of carbonate of ammonia. In the burning of hartshorn, a sufficient fire, and the free admission of air are necessary. The potter's furnace was formerly directed, for the sake of convenience; but any common furnace or stove will do. Indeed, too violent a heat makes their surface undergo a kind of fusion and vitrification, which both prevents the internal parts from being completely burnt, and renders the whole less soluble. M. Planche has proposed a modification of the ordinary process. " He places on the grate of a reverberatory furnace a layer of about two inches of wood charcoal, and fills the remainder of the furnace with horn, leaving convenient spaces between the pieces for the air to penetrate ; the furnace is then covered with its dome, and this is terminated by an iron-pipe, which ought to discharge itself by its upper aperture into the chimney of the laboratory. The mouth of the fire-place and the other openings of the furnace are to be luted, the chimney tube alone remaining open. The charcoal is kindled through this opening, which is not long in communicating the inflammation to the horn. The operation, which goes on of itself, is finished when no more flame is perceived to issue from the pipe. After the furnace has cooled, and the hartshorn has been taken out, the whitest pieces are selected, which are made into troches. The blackened or bluish pieces are pulverized and placed in the apparatus for calcining magnesia, and heated to a red heat for about an hour. By this new operation the horn acquires the whiteness which is required.

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* *Syn.* Subphosphas calcis, Calcaria subphosphorica.

According to the analysis of Merat Guillot, hartshorn consists of 27. gelatine, 57.5 phosphate of lime, 1. carbonate of lime, and there was a loss of 14.5, probably water. Now, as the gelatine is destroyed by burning, and the water expelled, the substance which remains is phosphate of lime, mixed with less than two *per cent.* of carbonate of lime. Fourcroy and Vauquelin have analyzed bones more accurately, and found that they contain also phosphate of magnesia, iron, and manganese. In human bones there are also traces of alumine and silex.

Med. use.—From its white earthy appearance, the powder of burnt bone was formerly considered as an absorbent earth. But since its composition has been ascertained, that idea has been laid aside, and its use has been suggested as a remedy in rickets, a disease in which the deficiency of the natural deposition of phosphate of lime in the bones seems to be the essential, or, at least, the most striking symptom. Mr Bonhomme, therefore, gave it to the extent of half a scruple, mixed with phosphate of soda, in several cases with apparent success. Whatever objections may be made to the theory, the practice certainly deserves a trial.

Off. Prep.—Pulvis cornu cervi cum opio, *L.* Calcis phosphas precipitatum, *D.* Phosphas sodæ, *E. D.*

CALCIS PHOSPHAS PRÆCIPITATUM. *Dub.*

Precipitated Phosphate of Lime.

Take of Burnt bones in powder, one part;
Dilute muriatic acid,
Water, of each two parts.

Digest together for twelve hours, and filter the solution. To this add water of caustic ammonia as much as will suffice to precipitate the phosphate of lime. Wash this with a sufficiently large quantity of water, and, lastly, dry it.

BY this process very fine phosphate of lime is obtained, and in a very minute state of division.

The phosphate of lime is dissolved by the muriatic acid, the carbonate of lime is decomposed, and the lime dissolved. On the addition of ammonia, the phosphate alone is thrown down, and is easily rendered quite pure by ablution. According to calculation, 37 parts of muriatic acid are capable of dissolving 56 of phosphate of lime, and 17 of ammonia suffice to precipitate the calcareous phosphate.

Precipitated phosphate of lime is a harsh amorphous powder, of a pure white colour, without taste or smell, very soluble in nitric, muriatic, or acetic acid, and precipitated unchanged from these solutions by ammonia. From its solution in acetic acid, phosphate of lead is formed on the addition of a solution of acetate of lead.

Med. use.—For internal use, on account of its more minute division, it is preferable to bone-ashes. It is given chiefly in rickets, in doses of from three grains to half a drachm. From its insolubility I should consider it absolutely inert.

MAGNESIA. *Ed.*

Magnesia *.

Let carbonate of magnesia, put into a crucible, be kept in a red heat for two hours; then put it up in close-stopt glass vessels.

Lond.

Take of Carbonate of magnesia, four ounces.

Burn it with a very fierce fire for two hours, or until acetic acid dropped upon it cause no effervescence.

MAGNESIA USTA. *Dub.*

Calcined Magnesia.

Take of Carbonate of magnesia, any quantity.

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* *Syn.* Magnesia salis amari usta, Magnesia pura, Oxydum magnesii.

Expose it to a strong heat in a crucible, for two hours; and, when cold, put the magnesia into a glass vessel.

By this process the carbonate of magnesia is freed from its acid and water; and, according to the late Dr Black's experiments, loses about $\frac{7}{12}$ of its weight. A kind of opaque, foggy vapour is observed to escape during the calcination, which is nothing else than a quantity of fine particles of magnesia, buoyed off along with a stream of the disengaged gas. About the end of the operation, the magnesia exhibits a kind of luminous or phosphorescent property, which may be considered as a pretty exact criterion of its being deprived of its acid. To be certain that the calcination is complete, test the magnesia by muriatic acid, which should dissolve it without effervescence; but it is necessary to know, that, when trial is made of well calcined magnesia by plunging it into the acid, there is a kind of crackling sound produced, which must not be confounded with effervescence. The magnesia, still warm, must then be inclosed in a ground stoppered bottle.

The more strongly magnesia is heated the heavier it becomes, and the less readily soluble in acids. A crucible capable of containing six pints of water, holds scarcely twelve ounces of white carbonate of magnesia. To economize space, M. Robinet conceived the idea of moistening the magnesia, and compressing it strongly in a linen cloth so as to form a cake of less bulk. He calcined in this way thirty ounces of magnesia, and in an hour and a half got twelve ounces of caustic magnesia, pretty dense. He then passed it through a tamis cloth, and thus got an impalpable powder.

Another mode of obtaining caustic magnesia is by precipitating the sulphate by a solution of caustic potass; and from its great density it is supposed that in this way Henry's magnesia is prepared.

On the Continent great levity is reckoned one of the properties desired in calcined magnesia, and yet Henry's magnesia, which is the most esteemed in this country, is at least four times heavier than that obtained by the common process.

Magnesia must be kept in close vessels, because it attracts, though slowly, the carbonic acid of the atmosphere. Although scarcely soluble in water, by the experiments of Dr Fyfe, it is less soluble in boiling than in cold water. Its sp. gr. is 2.33, and when sprinkled with water, it absorbs about 18 *per cent.* and heat is produced. Magnesia decomposes alum, borax, tartrate and succinate of ammonia, tartrate of potass, tartrate of potass and soda, and all the officinal metallic salts.

Med. use.—It is used for the same general purposes as the carbonate. In certain affections of the stomach, accompanied with much flatulence, magnesia is preferable, both because it contains more magnesia in a given bulk, and, being deprived of its acid, it neutralizes the acid of the stomach, without any extrication of gas, which is often a troublesome consequence when carbonate of magnesia is employed in these complaints.

CARBONAS MAGNESIÆ. *Ed.*

Carbonate of Magnesia *.

Take of Sulphate of magnesia, four parts;
Subcarbonate of potass, three parts;
Boiling water, a sufficient quantity.

Dissolve the salts separately in twice their weight of the water, and let the liquors be strained, or otherwise freed from their fæces; then mix them, and instantly add eight times their weight of boiling water. Let the liquor boil for a little on the fire, stirring it at the same time; then let it rest till the heat be somewhat diminished; after which strain it through linen; the carbonate of magnesia will remain upon the cloth, and is to be well washed with pure water, and afterwards dried with a gentle heat.

Lond.

Take of Sulphate of magnesia, one pound;
Subcarbonate of potass, nine ounces;
Water, three gallons.

Dissolve separately the subcarbonate in three pints of the water, and the sulphate in five, and filter. Then add the rest of the water to the solution of the sulphate; boil it, and, while it is boiling, mix with it, under constant stirring, the solution of the subcarbonate, and filter through linen. Lastly, wash the powder with repeated affusions of boiling water, and dry upon blotting paper, with a heat of 200°.

Dub.

Take of Sulphate of magnesia, twenty-four parts;
Carbonate of potass, fourteen parts;
Boiling water, four hundred parts.

Dissolve the sulphate of magnesia and the carbonate of potass, each in two hundred parts of water. Mix the defæcated liquors. Boil the mixture a little, and, while still warm, filter it through linen, stretched, so as to fit it for collecting the magnesia. Wash off the sulphate of potass, by repeated affusions of boiling water; and, lastly, dry the carbonate of magnesia.

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* *Syn.* Magnesia carbonica, Magnesia alba, Subcarbonas magnesiæ, Carbonas magnesicum, Magnesia salis amari.

SULPHATE of magnesia consists of 40 acid, 20 base, and 63 water = 123. Subcarbonate of potass, of 22 acid, 48 base, and 18 water = 88, which quantities mutually decompose each other; but the subcarbonate of potass is often moist and partially converted into sesquicarbonate, of which a larger quantity is necessary for the total decomposition of the sulphate.

The officinal carbonate of magnesia is prepared by mixing together concentrated and hot solutions of the sulphate of magnesia and carbonate of potass. The potass unites itself to the sulphuric acid, while the carbonic acid combines with the magnesia, to form subcarbonate of magnesia. The precipitate is said to turn out lighter and whiter, the less water there is used in its preparation. The large quantity of water ordered by the colleges is intended for the solution of the sulphate of potass formed; and the boiling heat is indispensably requisite for the expulsion of a portion of the carbonic acid, which, in consequence of the alkali being partly in the state of sesquicarbonate, is furnished in excess by the alkali, and would otherwise retain a part of the magnesia in solution. 70 parts of dry subcarbonate of potass are sufficient for the decomposition of 123 parts of sulphate of magnesia; and, from these quantities, about 42 parts of carbonate of magnesia are obtained.

The ablutions should be made with very pure water. Hard water, for this process, is peculiarly inadmissible, as the principle in waters, giving the property called *hardness*, is generally a salt of lime, which decomposes the carbonate of magnesia by compound affinity, giving rise to carbonate of lime, while the magnesia unites itself to the acid of the calcareous salt, by which not only the quantity of the magnesia is lessened, but it is rendered impure by the admixture of carbonate of lime. Another source of impurity is the silica, which the subcarbonate of potass generally contains. It is most easily got rid of by exposing the alkaline solution to the air for several days before it is used. In proportion as it is converted into sesquicarbonate, the silica is precipitated, and may be separated by filtration.

The carbonate of magnesia of commerce is also prepared from the muriate of magnesia, which remains in solution after the crystallization of muriate of soda from sea-water.

The carbonate of magnesia, thus prepared, is a very light, white, opaque substance, without smell or taste, almost insoluble in water, effervescing with acids. Its composition differs according to its mode of preparation. Berzelius found it to consist, after being thoroughly washed with boiling water, of 44.58 magnesia, 35.7 acid, and 19.72 water; and he considers it as a compound of 3 primes of carbonate of magnesia and 1 of quadrohydrate. Bucholz prepares two varieties; a *lighter*, with 8 lbs. avoird. of sulphate of magnesia dissolved in 48 lbs. of pure cold water, and 13 lbs. 6 oz. of carbonate of soda dissolved in twice its weight of cold water, and the precipitate washed two or three times with 8—12 times as much cold water; and a *heavier*, with 8 lbs. of sulphate dissolved in 48 lbs. boiling water, and 9 lbs. 6 oz. carbonate of soda dissolved in 18 lbs. boiling water, and kept boiling for 15 minutes after being mixed. The light variety is extremely spongy and light, is somewhat coherent, and has a fine feel like starch; it contains 32 acid, 33 base, and 35 water. The heavy variety has no cohesion, is evidently heavier, and feels granular like fine sand. It contains 35 acid, 42 base, and 23 water.

Carbonate of magnesia is decomposed by all the acids, potass, soda, baryta, lime, and strontia, the sulphate, phosphate, nitrate, and muriate of alumina, and the superphosphate of lime.

A solution of supercarbonate of magnesia, prepared in imitation of the supercarbonate of soda, has been lately introduced into commerce, which answers very well the purposes for which it is adapted.

Med. use.—Carbonate of magnesia is principally given to correct acidity of the stomach, and, in these cases, to act as a purgative: for solutions of magnesia in all acids are bitter and purgative, while those of the other earths are more or less austere and astringent. A large dose of magnesia, if the stomach contain no acid to dissolve it, neither purges nor produces any sensible effect; a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures several stools; whereas carbonate of lime, in the same circumstances, instead of loosening, binds the belly. When the carbonate of magnesia meets with an acid in the stomach, there is extricated a considerable quantity of carbonic acid gas, which sometimes causes uneasy distention of the stomach, and the symptoms of flatulence. In such cases, therefore, magnesia is preferable to its carbonate; but, on other occasions, as in nausea and vomiting, good effects arise from the action of the gas evolved. It is also used against the lithic diathesis, when it depends upon the tendency to generate uric acid.

Off. Prep.—Mistura camphoræ cum magnesia, *D.* Hydrargyrum cum magnesia, *D.*

MAGNESIÆ SULPHAS PURUM. *Dub.*
Pure Sulphate of Magnesia.

Take of Commercial sulphuric acid, twenty-five parts;
Water, one hundred parts;
Carbonate of magnesia, twenty-four parts, or as much as may be required to saturate the acid.

Mix the sulphuric acid and water, and then gradually add the carbonate of magnesia. Lastly, evaporate the filtered liquor, so as to crystallize on cooling.

THE sulphate of magnesia of commerce is in general sufficiently pure for medical purposes, and is so cheap, that there is no probability of this process ever being employed, except for experiment. It is an example of dissolution, the carbonic acid being evolved, while the magnesia combines with the sulphuric acid. Carbonate of magnesia may be assumed to consist of 20 magnesia, 22 carbonic acid, and 9 water = 51; for the solution of which will be required 49 of strong sulphuric acid, diluted with water; and the sulphate of magnesia produced is formed of magnesia 20, sulphuric acid 40, and water 63 = 123.

ALUMEN EXSICCATUM. *Ed.*
Dried Alum[*].

Melt alum in an earthen or iron vessel, and keep it over the fire until it cease to boil. Then powder it.

ALUMEN EXSICCATUM. *Lond.*
Dried Alum.

Melt alum in an earthen pot over the fire, and increase the heat until the ebullition cease.

ALUMEN SICCATUM. *Dub.*
Dried Alum.

Take of Alum, any quantity.

Expose it in an earthen vessel to a strong fire, until it cease to boil. Lastly, reduce it to powder.

THE vessel in which this process is conducted must contain at least three times as much as the bulk of the alum operated on, as this swells exceedingly in melting, and would otherwise boil over.

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[*] *Syn.* Sulphas aluminico-kalicus.

Mr Chaptal found, that by exsiccation in a red heat, alum of his own manufacture lost 67, Roman alum 50, English alum 47, and Levant alum 40 *per cent.* These differences arise principally from different proportions of water of crystallization, but also from an excess of alumina, which the last contains.

According to Kirwan, crystallized alum consists of 17.66 acid, 12 alumina, and 70.24 water; and alum desiccated at 700°, of 36.25 acid, and 63.75 basis; by which it would appear, that at that heat it loses not only all its water, but also more than half its acid, or is converted into a subsulphate.

Med. use.—Dried alum is only applied externally, as a gentle escharotic to fungous ulcers.

CHAP. V.—METALLINE PREPARATIONS.

ANTIMONY.

ANTIMONII SULPHURETUM PRÆPARATUM. *Ed.*

Prepared Sulphuret of Antimony[*].

Powder sulphuret of antimony in an iron mortar, levigate it upon a porphyry stone with a little water, and put it into a large vessel: Then pour upon it water which is to be decanted off loaded with the fine powder, by frequently agitating the vessel. On allowing the water to settle, the powder will subside, and is then to be dried.

The coarse powder which the water could not suspend, is to be again levigated and treated in the same way.

Dub.

Take of Sulphuret of antimony, any quantity.

Reduce it to powder, and separate for use the impalpable particles, in the manner directed for the preparation of chalk.

By reducing the sulphuret of antimony to the state of an impalpable powder, it is rendered more active. Buchner found, that when long exposed to the air after being powdered, it was partially oxidized, and formed some tartar-emetic when boiled with a solution of cream of tartar. Hence it is not a very certain remedy. In general, it operates very mildly; but sometimes it becomes more active, producing vomiting and hypercatharsis.

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[*] *Syn.* Stibium sulphuratum nigrum, Sulfuretum stibii, Sulphuretum stibii nigrum, Antimonium crudum.

Med. use.—It is principally given in scrofula, glandular obstructions, cutaneous diseases, and rheumatism. Its dose is from 10 to 30 grains, and upwards; and it is best exhibited in the form of a powder or bolus. It seems to constitute a quack remedy, which has acquired some reputation in Ireland for the cure of cancer. It is used externally for dressing the sore.

Off. Prep.—Sulphur antimoniatum fuscum, *D. E. L.* Pulvis antimonialis, *D.* Antimonii oxydum nitro-muriaticum, *D.* Oxydum antimonii cum phosphate calcis, *D.* Tartras antimonii, *D.*

SULPHURETUM ANTIMONII PRÆCIPITATUM. *Ed.*

Precipitated Sulphuret of Antimony *.

Take of Water of potass, four pounds;
Water, three pounds;
Prepared sulphuret of antimony, two pounds;
Dilute sulphuric acid, a sufficient quantity.

Mix the sulphuret with the solution of potass and the water, then boil them in a covered iron pot, over a slow fire, for three hours, adding more water, if necessary, and frequently stirring the mixture with an iron spatula; strain the liquor, while warm, through a double linen cloth, and add to it, when filtered, as much of the acid as is necessary to precipitate the sulphuret, which must be well washed with warm water.

Lond.

Take of Sulphuret of antimony, in powder, two pounds;
Solution of potass, four pints;
Distilled water, three pints.

Mix and boil, with a gentle fire, for three hours, constantly stirring, and adding, from time to time, as much distilled water as to keep up the original quantity. Quickly filter the solution through double linen, and gradually drop into it, when still hot, as much diluted sulphuric acid as may precipitate it; then wash away the sulphate of potass with warm water; dry the precipitated sulphuret of antimony, and triturate it to powder.

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* *Syn.* Kermes minerale, Sulphur stibiatum rubrum, Oxydul. stibii hydrosulphurat. rubrum, Hydrosulph. oxyduli stibii, Hydrosulph. rubrum stibii sulphurati, Hydrosulph. stibiosum, Stibium oxydulat. hydrothionicum.

Sulphur auratum antimonii, Sulphur stibiatum aurantiacum, Oxydulum stibii hydrosulph. aurant. Sulphuret. oxyduli stibii hydrogenatum, Hydrosulph. luteum oxydi stibii sulphurati, Hydrosulph. stibiosum cum sulphure, Oxyd. stibii sulphurat. praecip. Stibium oxydulat. sulphurato-hydrothionicum.

SULPHUR ANTIMONIATUM FUSCUM. *Dub.*
Brown Antimoniated Sulphur.

Take of Prepared sulphuret of antimony, one part;
Water of caustic potass, eighteen parts;
Dilute sulphuric acid, eleven parts, or as much as may be required.

Add the sulphuret of antimony to the water of caustic potass, and boil for an hour. Filter the liquor, boiling hot, through double linen, and drop into it the dilute sulphuric acid. Wash away the sulphate of potass with warm water. Dry the brown antimoniated sulphur, and rub into a very fine powder.

AFTER the labours of many of the most distinguished chemists, the true constitution of this antimonial compound is not positively ascertained. According to Berzelius, it is only a hydrate of the sulphuret of antimony; but a different view has been given by Buchner, who has examined the subject with great attention. He states it to consist of sulphuret of antimony, 52.5; protoxide of antimony, 27.5; water chemically united, 5; hygroscopically, 15=100; or nearly one prime of protoxide of antimony, and two primes of sulphuret of antimony, with four primes of water, three of which are hygroscopical, and may be expelled by a gentle heat, without altering the nature of the substance, and one chemically combined, requiring a red heat for its expulsion. Buchner thinks that the sulphuret of antimony here acts as an acid, to which he has given the name of stibiothionic acid, and that Kermes mineral is a stibiothionate of antimony in the state of a hydrate.

The golden sulphuret of antimony contains no protoxide. It may be considered as a bisulphuret of antimony in the state of hydrate, but it may contain still more sulphur. Geiger found it to consist of sulphuret of antimony 73, sulphur 16, and water and loss 11, being very nearly one prime of antimony, two of sulphur, and one of water.

When in the processes of the colleges sulphuret of antimony is boiled with a solution of potass, water is decomposed, the oxygen unites with the antimony to form its protoxide, and the hydrogen with the sulphur to form hydrothionic acid, which unites with both bases. On cooling, *Kermes mineral* separates and subsides; and Buchner states there remains in the solution sulphuret of antimony dissolved in the alkaline ley by hydrothionic acid. When an acid is added to this solution, the sulphuretted hydrogen is expelled, and *sulphur auratum antimonii* is precipitated, which consists of sulphuret of antimony 90, and water 10. Buchner does not expressly state the nature of the precipitate, when, according to the directions of the British Colleges, the acid is added to the hot solution before any precipitation from cooling takes place; but we may infer that it contains no protoxide of antimony, and is merely a hydrated sulphuret; for, when speaking of the *sulphur auratum antimonii*, he says, " It might be thought that this preparation also contains protoxide of antimony, as the Kermes does; but this is not the case, for the sulphuretted hydrogen set free by the addition of the acid, immediately disoxydizes it, and water and sulphuret of antimony are produced."

If Buchner's view be on the whole correct, we see that the Kermes obtained by precipitation with an acid is a very different substance, and probably much less active than that which is spontaneously deposited on cooling, as directed in the foreign pharmacopœias. It may not therefore be superfluous to give a formula for the latter. Boil two pounds of crystallized subcarbonate of soda, dissolved in twenty pounds of water, for half an hour, in an iron kettle, with an ounce of levigated sulphuret of antimony, and filter the solution into a heated vessel to cool slowly. After deposition, the precipitate is to be separated by filtration, and dried on bibulous paper. The filtrated solution may be employed to dissolve another quantity of sulphuret of antimony. Cluzel found that the Kermes is not nearly so beautiful when subcarbonate of potass is used.

Med. use.—In its action on the body, the hydrosulphuret of antimony is considered as an active substance, and, according to the dose, to operate as a diaphoretic, cathartic or emetic.

On some parts of the continent, very erroneous ideas are entertained of the activity of mineral kermes. In their posological tables, the dose is fixed at one-fourth to half a grain several times a-day. Induced by the freedom with which tartar emetic and antimonial powder have been lately employed, I tried to ascertain the effects of mineral kermes in large doses, and found that even ten grains given three times a-day often did not produce any appreciable effect. On other occasions these large doses induced nausea and diaphoresis.

ANTIMONII OXYDUM NITRO-MURIATICUM. *Dub.*
Nitro-Muriatic Oxide of Antimony *.

Take of Prepared sulphuret of antimony, twenty parts;
Muriatic acid, one hundred parts;
Nitric acid, one part.

Add the sulphuret gradually to the acids, previously mixed in a glass vessel, avoiding the vapours. Digest with a heat gradually increased, until the effervescence cease, and then boil for one hour. Receive the cooled and filtered liquor in a gallon of water. Wash the oxide of antimony, after it has subsided, repeatedly in a sufficiently large quantity of water, until the liquor poured off be perfectly free from acid, as known by the test of litmus; and, lastly, dry the oxide upon bibulous paper.

In this process, when sulphuret of antimony is acted upon by muriatic acid, assisted by heat, water is decomposed, sulphuretted hydrogen gas is evolved, and muriate of antimony remains in solution. The small quantity of nitric acid is added for the purpose of decomposing the sulphuretted hydrogen, which otherwise would colour the product. The solution, immediately after being filtered, is poured into a large quantity of water. By this it is decomposed, a white powder formed of minute acicular crystals is precipitated, probably a dichloride, consisting of one prime chlorine 36, and two primes antimony 88 = 124, and there remains a bimuriate in solution. The precipitate is washed in a sufficient quantity of water, which removes the muriatic acid, and leaves the pure protoxide of antimony, which constitutes the preparation of the Dublin College. If instead of decomposing the muriatic solution by water, it is poured into a solution of an alkaline carbonate, then the whole of the antimony is thrown down at once in the form of a pale yellow smooth powder, the protoxide of antimony. According to Dr Barker, 20 parts of sulphuret yield 16.5 of oxide of antimony.

Chloride of antimony was first prepared by distilling sulphuret of antimony with corrosive sublimate. Butter of antimony as it was called, from its appearance when recently prepared, passed over into the receiver, and black sulphuret of quicksilver remained in the retort; or by increasing the heat, red sulphuret of mercury, which, when obtained by this process, was formerly termed Cinnabar of antimony, was sublimed. But this mode of preparation is both expensive and dangerous to the health of the operator, and has been abandoned.

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* *Syn.* Stibium oxydulatum, Antimonii oxydum, Oxydum stibiosum, Submurias antimonii.

M. Thenard says that a very fine chloride of antimony may be obtained by passing a stream of chlorine along pieces of antimony duly heated; the chloride is directly formed, and is collected with the greatest facility.

M. Robiquet has published a process, in which powdered metallic antimony is treated by five times its weight of *Aqua regia*, made with one part of nitric acid at 32°, and four parts of muriatic acid at 22°. The solution is distilled in a retort, and the product is collected in a fresh receiver, after it has attained an oleaginous consistency.

Muriate of antimony, or Chloride of antimony as it is now called, consists of chlorine 36, and antimony 44 = 80, is crystallizable, but in general it occurs as a soft semitransparent substance, of a yellowish-white colour, very fusible and volatile at a moderate degree of heat. It is remarkably deliquescent, and forms a permanent solution.

The liquid muriate of antimony sold in the shops has no smell, is transparent, sometimes colourless, at other times brown. Its goodness is judged of by its forming a precipitate with water.

Med. use.—Muriate of antimony has been used as a caustic, but not for a long time, on account of its being unmanageable.

Off. Prep.—Antimonii et potassæ tartras, *D.*

OXIDUM ANTIMONII CUM PHOSPHATE CALCIS. *Ed.*

Oxide of Antimony, with Phosphate of Lime *.

Take of Sulphuret of antimony, in coarse powder,
Shavings of hartshorn, equal weights.

Mix and put them in a shallow iron pot, red-hot, and stir the mixture constantly, until it become of an ash-grey colour, which is then to be removed from the fire, ground into powder, and put into a coated crucible. Lute to this crucible another inverted over it, and perforated in the bottom with a small hole, and apply the fire, which is to be raised gradually to a white heat, and kept in that increased state for two hours. Lastly, grind the matter, when cold, into a very fine powder.

PULVIS ANTIMONIALIS. *Dub.*

Antimonial Powder.

Take of Prepared sulphuret of antimony, one part;
Shavings of hartshorn, two parts.

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[*] *Syn.* James's powder, Pulv. de phosphat. calcis cum stibio, Oxydum stibii cum subphosphate calcis, Phosphas calcicum stibiatum.

Mix them, and throw the mixture into a wide iron pot, heated to redness, stirring continually until the sulphureous vapour cease, and the mass acquire an ash-grey colour. When cold, reduce it to powder, and put it into a crucible. Fit to this another inverted crucible, having a small hole in its bottom. Expose the substance for two hours to a heat gradually increased to whiteness, and, when cold, grind it to a very fine powder.

Lond.

Take of Sulphuret of antimony in powder, one pound;
Horn-shavings, two pounds.

Mix, and throw them into a wide crucible, heated to whiteness, stirring them assiduously until no visible vapours ascend; powder the residuum, and put it into a fit crucible. Then apply heat, and gradually increase it, until it be kept white for two hours. Triturate the residuum into a very subtile power.

This is supposed to be nearly the same with the celebrated nostrum of Dr James, which, according to the analysis of Dr G. Pearson, confirmed by Mr Phillips, consists of 43 phosphate of lime, and 57 oxide of antimony.

By burning sulphuret of antimony and shavings of hartshorn in a white heat, the sulphur is entirely expelled, and the antimony is oxidized, while the gelatine of the hartshorn is destroyed, and with a loss of weight of 37 to 41 *per cent.* nothing of it is left but phosphate of lime, combined with a little lime. Therefore, the mass which results is a mixture of oxide of antimony and phosphate of lime. Mr Phillips analyzed two specimens, the one of which contained 35, and the other 38 *per cent.* of peroxide of antimony, and 65 and 62 phosphate of lime, respectively. Mr Brande says, that he has generally found a greater discordance, and sometimes as much as 5 *per cent.* protoxide of antimony, which will account for the great diversity of effects ascribed to this preparation.

In the London and Dublin Pharmacopœias, twice the proportion of hartshorn shavings is used, which is said to obviate the inconvenience of the vitrification of part of the antimony when too high a temperature was applied, to render the process more manageable, and to furnish a whiter product; but the product does not correspond so nearly with Dr Pearson's analysis of James's powder.

Mr Chenevix, by considering the uncertainty of the application, and the precarious nature of the agency of fire, by which means a variable portion of the oxide of antimony may be volatilized, and that which remains may be oxidized in various degrees, proposes to prepare a substitute for James's powder, by dissolving together equal weights of submuriate of antimony and of precipitated phosphate of lime, in the smallest possible quantity of muriatic acid, and then pouring this solution gradually into water sufficiently alkalized with ammonia. As muriate of antimony is partially decomposed by water, it is absolutely necessary that the muriatic solution be poured into the alkaline liquor; for, by an opposite mode of procedure, a great part of the antimony would be precipitated in the state of submuriate, and the first portion of the precipitate would consist chiefly of antimony and the last of phosphate of lime. Mr Chenevix also found, that this precipitate is entirely soluble in every acid which can dissolve either phosphate of lime or oxide of antimony separately, and that about 0.28 of James's powder, and, at an average, 0.44 of the pulvis antimonialis of the London Pharmacopœia, resist the action of every acid. Mr Brande, however, does not approve of this preparation, as the precipitate is apt to get horny or gritty and difficult to powder.

Med. use.—The oxide of antimony with phosphate of lime, howsoever prepared, is one of the best antimonials we possess. It is given as a diaphoretic in febrile diseases, in doses of from three to eight grains, repeated every third or fourth hour. In larger quantities, it operates as a purgative or emetic. Its effects seem however to vary much, perhaps from idiosyncrasy of constitution or variety of the preparation. Mr Hawkins gave ʒ i. morning and evening without any obvious effect, and I have given ℈ i. and ʒſs doses, repeated several times a-day, without inducing vomiting or purging. From its insolubility, it must be given either in the form of a powder, or made into a pill or bolus.

TARTRAS ANTIMONII, *olim* TARTARUS EMETICUS. *Ed.*
Tartrate of Antimony, formerly *Tartar-Emetic.*

Take of Sulphuret of antimony,
Nitrate of potass, equal weights;
Supertartrate of potass, what may be required.

Powder the sulphuret and nitrate separately, mix them thoroughly, and inject them into a hot crucible. After the deflagration is finished, separate the reddish matter obtained from the white crust, and grind to a very fine powder, which is afterwards to be washed with much warm water, and then dried.

Mix this powder by trituration, with an equal weight of supertartrate of potass, and boil the mixture with four times its weight of water for an hour, and evaporate the filtered solution so as to crystallize.

The first part of this process is that formerly directed for the preparation of what was formerly called Crocus of antimony *, which is no longer ordered as a separate process, and therefore must be spoken of in this place.

In this process, the nitric acid of the nitre is entirely decomposed, the nitrogen is evolved in combination with more or less of the oxygen; at the same time part of the sulphur and of the antimony is acidified, forming acids which unite with the potass of the nitre, while part of the antimony is converted into protoxide, which combines with the undecomposed portion of the sulphuret, and forms a dark brown, opaque, vitrified mass; so that, after the *scoriæ*, and other saline matters, have been removed by washing, the substance which remains consists, according to Proust, of three parts of protoxide of antimony and one of sulphuret of antimony. Buchner considers it as a stibiothionate of antimony with excess of base.

With regard to the mode of preparation, Bergman observes, that by throwing the mixture into an ignited uncovered crucible, there is sometimes a loss of nearly one half. Indeed, the application of heat to the crucible is unnecessary. The mixture may be put into a clean iron pot, and kindled by touching it with the end of a tobacco pipe, or iron rod, heated to redness. In this way the fusion and separation of the *scoriæ* is no less complete than when the mixture is gradually projected into a heated crucible, and, unless for very great quantities, it is most convenient.

The crocus kept in the shops is generally prepared with less nitre than is here ordered. The consequence is, that too much sulphur remains not acidified, the antimony is scarcely oxidized, and the preparation is unfit for the uses to which it ought to be applied. When nitre has been thus economized, the crocus has a steel grey, instead of a liver brown colour. The colour of its powder, when levigated, is greenish-brown.

Med. use.—The crocus of antimony is a very uncertain preparation, often operating with very great violence. Its internal use is, therefore, almost proscribed, or at least confined to veterinary practice.

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* Stibium oxydulatum fuscum, Crocus metallorum, Oxydum stibicum cum sulphureto stibii.

ANTIMONIUM TARTARIZATUM. *Lond.*
Tartarized Antimony *.

Take of Glass of antimony, in very subtile powder,
Supertartrate of potass in powder, each one pound;
Distilled water, one gallon.

Mix the glass of antimony and supertartrate intimately together, and throw them gradually into the boiling water, stirring it constantly with a rod; boil for a quarter of an hour, and set it aside. Filter the liquor when cold, and when filtered, boil it down to form crystals.

ANTIMONII ET POTASSÆ TARTRAS, *sive* TARTARUM EMETICUM. *Dub.*
Tartrate of Antimony and Potass or *Emetic Tartar.*

Take of Nitromuriatic oxide of antimony, four parts;
Bitartrate of potass, in very fine powder, five parts;
Distilled water, thirty-four parts.

Boil the water in a glass vessel, then gradually throw into it the oxide and bitartrate of potass, previously mixed, and boil for half an hour; then filter the liquor through paper, and crystallize by slow cooling.

THE tartaric acid is capable of combining, in many examples, with two bases at the same time, forming with them triple crystallizable salts. In the present instance it is combined with protoxide of antimony and potass; and as the potass is essential to its constitution, and the real tartrate of antimony is a different salt, the name of this preparation, on chemical principles, should certainly have been Tartrate of antimony and potass, but the old name of Tartar-emetic is without ambiguity.

In the preparation of this salt, the different combinations of protoxide of antimony, the crocus, precipitated oxide, submuriate and glass, have all been occasionally employed. Any of them will afford a very pure salt.

The Edinburgh College uses the crocus. To this the principal objection is, that it is rarely found in the shops in a state fit for this purpose. Even when properly prepared, it is with difficulty acted upon by the supertartrate of potass, unless it be levigated and elutriated. The glass used by the London and Parisian Colleges is more easily soluble than the crocus.

To the use of the submuriate, as directed by the Dublin College, the chief objection is its expense. M. Henry, chief of the central pharmacy of the Parisian hospitals, has published an excellent paper on the preparation of tartar-emetic, and has instituted a comparison of the respective productiveness of the processes of the Colleges, from which the following facts are extracted, while the Supplement to the former edition of this Dispensatory is referred to for the detail.

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* *Syn.* Tartarus stibiatus, Tartras lixiviæ stibiatus, Tartris pot. stibiata, Tartarum antimoniatum, Deutotartras potassii et stibii, Tartras kalico-stibiatus, Tartras stibii et potassæ.

Process of Edinburgh.—125 grammes of sulphuret of antimony, the same quantity of nitrate of potass, and 50 grammes of bitartrate of potass, (cream of tartar,) by *deflagration* produced 50 grammes of tartar-emetic; and by *inflammation*, the same quantities gave 53 (in another place it is said 60, A. D.) of tartar-emetic.

Process of London.—Glass of antimony, 125; bitartrate of potass, 185; water, 1.500, produced 195.

Dublin process.—Sulphuret of antimony and bitartrate of potass, of each 125 grammes; muriatic acid, 690; nitric acid, 8; distilled water, 1.125, gave 147 grammes of tartar-emetic.

M. Henry, after having discussed the merits and demerits of each of these processes, gives the preference to the process of the Dublin Pharmacopœia, as being the preparation most to be relied upon, and capable of furnishing a product always pure, besides that by the first operation very white crystals are obtained; but he has thought it advantageous to increase the proportion of bitartrate of potass, and to introduce some modifications which his experiments have led him to think useful.

But whatever form of protoxide of antimony may be preferred, the quantity of water employed must be sufficient to dissolve the tartar-emetic formed. The time during which the ebullition is to be continued is stated differently by different pharmaceutists. No harm can arise from continuing it longer than is absolutely necessary; but it is certainly a waste of time and fuel to protract it for hours.

Another circumstance which renders tartar-emetic variable in its effects, is, the mode of crystallization. Some pharmaceutists evaporate it to dryness; others to a pellicle, and set it aside to crystallize; and others again crystallize by slow evaporation. On account of the silica which is combined with the oxide of antimony in the crocus and glass, and which, being held in solution by the potass, impedes the crystallization, and varies the nature of the product, Vauquelin recommends that the solution be first evaporated to dryness, and that the saline mass obtained should be redissolved in boiling water, and then crystallized; for, towards the end of the first evaporation, the silica separates, and becomes totally insoluble. In this way, he says, that we obtain both a purer salt, and in larger quantity. If we employ an excess of supertartrate of potass, part of it will remain undecomposed, and will crystallize before, or along with the tartar-emetic. This source of impurity is easily avoided, by using an excess of the antimonial oxide, which, remaining undissolved, occasions no error, and prevents the necessity of throwing away the crystals which form on the filtering paper, if the solution be saturated.

The primitive form of the crystals of tartrate of antimony and potass seems to be the regular tetrahedron, but it often occurs in octohedrons with a rhombic base. It has a styptic metallic taste. Its solubility in water is variously stated. Most writers, from Bergman to Fourcroy, say that it requires 80 parts of water at 60°, and somewhat less than forty of boiling water. By careful experiment, with very fine crystals of tartar-emetic, more than half an inch in length, and perfectly free from the admixture of any foreign salt, I found it to be soluble in three waters at 212°, and in fifteen at 60°. Dr Perceval of Dublin considered its being soluble in twelve waters as one of the best tests of its goodness; and Dr Barker found that good emetic tartar, dissolved in a boiling heat, remained in solution in 9.4 times its weight of water at 66°. The crystals, by exposure to the air, become white and opaque, but do not readily fall to powder. The solution of tartar-emetic slightly reddens tincture of turnsole. It is decomposed by acids, alkalies, alkaline carbonates, sulphuretted hydrogen and its compounds, vegetable juices, decoctions, and infusions, and many of the metals.

The most accurate analysis of tartar-emetic is that by Dr Thomson, who found it to consist of two primes of tartaric acid, 132; three of protoxide of antimony, 156; one of potash, 48; and two of water, 18=354. Mr Phillips found, that 100 parts of bitartrate of potass dissolve 70 of protoxide of antimony.

From what has been said, it will appear, that without any fraudulent intention, tartar-emetic is often imperfect. To ascertain its goodness, M. Henry dissolves one part of tartar-emetic in fourteen parts of distilled water. If the salt be mixed with insoluble substances, they remain at the bottom of the vessel. If the emetic be pure, it ought to be dissolved entirely, and should not crystallize at 60° F. It ought not to be precipitated by muriate of barytes, neutral oxalate of ammonia, acidulous nitrate of silver, or acetate of lead suitably acidulated. This last reagent detects in tartar-emetic even $\frac{1}{120}$th of cream of tartar, only time must be given that the precipitation may take place. It is prepared by dissolving eight parts of crystallized acetate of lead in thirty-two parts of distilled water warmed; the water which has evaporated is to be replaced, and the solution filtered, to separate a little carbonate of lead; to the liquid fifteen parts of acetic acid at 9°, specific gravity 1070, are then to be added. Tartar-emetic is often sold in the form of powder, to conceal its imperfections; this should be rejected.

Med. use.—In doses of from one to three grains it operates as an emetic, and sometimes as a cathartic. In smaller doses, it excites nausea, and proves a powerful diaphoretic and expectorant. As an emetic, it is chiefly given in the beginning of fevers and febrile diseases, in chincough, and, in general, whenever we wish to evacuate the stomach quickly. When great debility is present, and in the advanced stages of typhoid fever, its use is improper, and even sometimes fatal. As a diaphoretic, it is given in small doses, of from an eighth to a quarter of a grain; and as an expectorant, in doses still smaller.

Of late the use of tartar-emetic has been extended to almost all inflammatory diseases, chiefly by the Italians and French, as a contro-stimulant, or to depress the system. It is given in two ways; either in large doses, dissolved in the smallest quantity of water, upon an empty stomach, and all drink withheld; or in repeated doses of a weak solution. In the former way, I have never ventured upon the enormous doses exhibited by Rasori and Tommasini; but I have given to the extent of five grains at once without producing vomiting: and in the latter way, or in nauseating doses, I have often administered it with the best effect, when I did not think venesection could be borne.

The only proper form for exhibiting it is in solution; and as the intensity of its action on the body is liable to variation, from differences in its own strength, and in the constitution of the patient, it should almost always be given in divided doses, at short intervals, if we wish to excite vomiting; and at longer intervals, if we wish it to act only on the skin or lungs. Laennec's practice was to give one grain, dissolved in $2\frac{1}{2}$ ounces of weak cold infusion of orange leaves, sweetened with half an ounce of syrup of orange flowers, every two hours, until six doses be taken. In urgent cases, he gave to the extent of 2.5 grains for a dose, but always in the same quantity of vehicle.

Poisoning sometimes happens from excessive doses of tartar-emetic, and in its effects it coincides with arsenic, but it is easily decomposed. Since Vauquelin's discovery, that it is decomposed by cinchona, the decoction of that bark has been generally recommended; but in the case of Dr Duffin, who, by accident, swallowed a poisonous dose, I administered a solution of *hepar sulphuris* with perfect success.

Tartar-emetic is now very frequently applied externally, for the purpose of exciting inflammation and pustules in the skin, as a counterstimulant in internal inflammation. This practice was introduced by Autenrieth for the cure of chincough, and it was afterwards recommended by Dr Jenner in a variety of complaints.

Off. Prep.—Vinum tartratis antimonii, *E. L. D.* Unguentum tartari emetici, *D.*

VINUM TARTRATIS ANTIMONII. *Ed.*
Wine of Tartrate of Antimony.

Take of Tartrate of antimony, twenty-four grains;
Sherry wine, one pound.
Mix them, so that the tartrate of antimony may be dissolved.

VINUM ANTIMONII TARTARIZATI. *Lond.* LIQUOR TARTARI EMETICI. *Dub.*
Wine of Tartarized Antimony. Liquor of Tartar-Emetic.

Take of Tartarized antimony, one scruple;
Boiling distilled water, eight fluidounces;
Rectified spirit, two fluidounces.
Dissolve the tartarized antimony in the boiling distilled water, then add the spirit to the solution filtered.

FORMERLY antimonial wine was a fortuitous preparation, made by steeping glass of antimony in white wine; a portion of the glass of antimony was dissolved by the bitartrate of potass contained in the wine; and as the quantity of this is variable, so also the quantity of oxide of antimony dissolved varied; and, therefore, the preparation is with propriety entirely rejected, since its strength could never be known.

The officinal preparations contain two grains to an ounce of fluid. The Edinburgh College use wine, and the London and Dublin employ water, with a small proportion of spirits; but it certainly seems inconsistent that the London College should have resumed the appellation of *Vinum*, when they discard the wine from a preparation, which they called *Liquor*, when it contained wine.

It is convenient to have an officinal solution of a substance so frequently exhibited; and this, made with an alcoholic liquor, is not so liable to decomposition as a watery solution.

CHAP. VI.—SILVER.

ARGENTI NITRATIS CRYSTALLI. *Dub.*

Crystals of Nitrate of Silver [*].

Take of Silver flatted into plates, and cut into pieces, thirty-seven parts;
Dilute nitric acid, sixty parts.

Put the silver into a glass vessel, and pour upon it the acid. Gradually increase the heat until the metal be dissolved, and then obtain crystals by evaporation and refrigeration. Dry them without heat, and keep them in a glass phial, and in a dark place.

IN this process the silver is oxidized by the decomposition of a portion of the acid, and the oxide is dissolved in the remainder, while nitric oxide gas is evolved, forming red fumes of nitrous acid, on coming in contact with the air. The crystals are anhydrous, and consist, according to Dr Thomson, of one prime of protoxide of silver 118, and one of nitric acid 54=172.

The acid employed must be very pure. If it contain, as the acid of commerce always does, sulphuric or muriatic acid, these react upon the nitrate as soon as it is formed, and a white precipitate, consisting of sulphate or muriate of silver, falls to the bottom.

It is necessary to employ very pure water in this process; for the muriates and earthy salts which common water generally contains, precipitate part of the silver in the state of a muriate or oxide. If distilled water be not used, the water should be added to the acid before it be tried, and purified by the nitrate of silver.

The solution will go on the more speedily, if the silver, flatted into thin plates, be rolled loosely up, so that the several surfaces do not touch each other. By this management, a greater extent of the surface is exposed to the action of the menstruum, than when the plates are cut in pieces and laid above each other. If the silver be alloyed with copper, the solution will have a permanent greenish-blue colour, and acquire a bright blue on the addition of ammonia. If it contain gold, the gold is not dissolved, but is found at the bottom of the solution, in the form of a black or deep purple powder.

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[*] *Syn.* Argentum nitricum crystallizatum, Nitras argenticum crystallizatum, Crystalli lunares.

Nitrate of silver is crystallizable. Its crystals are brilliant plates, having a variable number of sides. Dr Barker says, that when made in large quantity, its crystals are regular rhomboids, and that its primitive form is a right rhombic prism. Their taste is austere, and intensely bitter. They are very soluble in water, permanent in the air, and not deliquescent. They are decomposed by heat, light, phosphorus, charcoal, many metals, all the alkalies and earths, sulphuric, muriatic, phosphoric, aud fluoric acids, and by the salts they form.

Med. use.—A strong solution of nitrate of silver corrodes and decomposes animal substances: in a more diluted state, it stains them of an indelible black: and, for this purpose, it is now used as a marking ink. A weak solution of it may be applied, as a stimulus, to indolent ulcers, or injected into fistulous sores, and is almost specific in ring-worm. A saturated solution has even been injected into the urethra in gonorrhœa; but I cannot approve of the practice, especially since, on a comparative trial, it was found not to remove the disease sooner than less suspicious remedies.

Notwithstanding its causticity, it has been given internally. Boërhaave, Boyle, and others, commend it highly in hydropic cases. The former assures us, that, made into pills with crumb of bread and a little sugar, and taken on an empty stomach (some warm water, sweetened with honey, being drank immediately after,) it purges gently, without griping, and brings away a large quantity of water, almost without the patient's perceiving it: that it kills worms, and cures inveterate ulcerous disorders. He nevertheless cautions against using it too frequently, or in too large a dose; and observes, that it always proves corrosive and weakening to the stomach. I have never observed it to produce these hydragogue effects.

It has been more recently employed with very great freedom, and with success, in epilepsy, chorea, and other spasmodic diseases. When it proves successful, the fits gradually become less severe, and occur at longer intervals; but sometimes, after giving hopes of a cure, the fits return as severely as before, and the medicine has lost its power over them. Also, when long continued, the nitrate of silver has the unpleasant effect of rendering the exposed parts of the skin of a dark colour, almost like that of a mulatto, apparently in consequence of the reduction of the silver by the action of light. This dark colour remains for life, or at least for a very long time, and almost resists all remedies, although it is said that a steady course of cream of tartar at last removes it. On account of its very great activity, each pill should not contain above one-eighth or one-fourth of a grain.

Off. Prep.—Argenti nitras fusum, *D.*

ARGENTI NITRAS FUSUM. *Dub.*

Melted Nitrate of Silver *.

Dissolve silver in dilute nitric acid, in the manner already mentioned, then evaporate the solution to dryness. Melt the residuum, put into a crucible, over a slow fire; pour it out into proper moulds, and keep it in a glass phial.

NITRAS ARGENTI. *Ed.*

Nitrate of Silver.

Take of Purest silver, flatted into plates, and cut in pieces, one part;
Diluted nitrous acid, two parts;
Distilled water, one part.

Dissolve the silver in the acid and water previously mixed, in a matrass with a gentle heat, and evaporate the solution to dryness. Then put the mass into a large crucible, and place it on the fire, which should at first be gentle, and afterwards increased by degrees till the mass flows like oil; then pour it into iron moulds previously heated and anointed with tallow. Lastly, keep it in a glass vessel very well corked.

Lond.

Take of Silver, one ounce;
Nitric acid, one fluidounce;
Distilled water, two fluidounces.

Mix the nitric acid with the water, and dissolve the silver in the mixture in a sand-bath. Then gradually increase the heat until the nitrate of silver become dry. Melt this in a crucible with a gentle fire, until the ebullition ceases from the expulsion of the water; then immediately pour it out into proper moulds.

WHEN melted according to the directions of the colleges, nitrate of silver forms a pale grey-coloured mass, hard, sonorous, and consisting of radii, diverging from the centre.

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* *Syn.* Argentum nitricum fusum, Lapis infernalis.

It is sometimes dark coloured, or almost black, from the separation of a portion of oxide from excessive heat, or from containing copper. When free from copper, which is seldom the case, it is not deliquescent. It may, however, be prepared perfectly pure, even from a solution containing copper, by evaporating and crystallizing it as long as it furnishes firm tabular crystals. These are then to be washed with a little distilled water, and melted with a gentle heat. The nitrate of copper remains in the mother water, from which the silver it contains may be precipitated by muriatic acid.

The crucible ought to be of porcelain; as, with the common crucibles, the loss arising from the nitrate of silver sinking into their substance is too great. It ought also to be large enough to hold five or six times the quantity of the dry matter; for it bubbles and swells up greatly, so as to be apt to run over. During the evaporation also, little drops are now and then spirted up, whose causticity is increased by their heat, against which the operator ought therefore to be on his guard. The fire must be kept moderate till this ebullition ceases, and till the matter becomes consistent in the heat that made it boil before: the fire is then to be quickly increased, till the matter flows thin at the bottom like oil, when it is to be immediately poured into the mould; for if the heat be continued after this, the nitrate of silver begins to be decomposed, and the silver is reduced.

The mould for casting nitrate of silver is called in France *Lingotiére.* It is commonly made of steel, and sometimes of copper; its sides are covered with a little oil, that the nitrate may not adhere to it. Each piece is to be wiped clean from the grease, and wrapt up in soft dry paper, not only to keep the air from acting upon them, but likewise to prevent their corroding or discolouring the fingers in handling.

Med. use.—The fused nitrate of silver is the strongest and most manageable caustic we possess, and is employed to remove fungous excrescences, callous edges, warts, strictures in the urethra, and the like. It is also used to destroy the venereal poison in chancres, before it has acted on the system. Mr Higginbottom has lately spoken highly in praise of nitrate of silver, as an effectual method of healing ulcers and external sores, by cicatrization. I am convinced that the method is often useful, but he appears to me to have exaggerated its good effects. There is no doubt that when it produces an adherent eschar, the cure may be considered to be effected; but I very much doubt whether, in bad cases, it be possible to produce any adherent eschar.

In ulcerated sore throat, nothing is more efficacious than the application of lunar caustic. In these cases it does not form an adherent eschar, but acts by stimulating the soré to a more active and healthy reaction. It becomes speedily clean, and its edges contract daily.

The French have also recommended the use of nitrate of silver to prevent the pitting from small pox, by arresting the progress of the pustules. I think it may be applied successfully to single pustules, when they appear in unfavourable situations, as upon the eyeball; but otherwise, I agree with the judgment of the less sanguine physicians of Paris, that in confluent cases the method is impracticable, and in other cases hurtful. It is admitted by its favourers, that the *methode ectrotique* is successful only in the first and second days. In distinct cases it is applied to each pustule individually; in confluent cases a solution is employed.

CHAP. VII.—ARSENIC.

ARSENICI OXYDUM ALBUM SUBLIMATUM. *Dub.*
Sublimed White Oxide of Arsenic *.

Expose white arsenic in coarse powder, in a proper vessel, to heat, avoiding the vapours, so that the white oxide of arsenic may be sublimed.

ARSENICUM ALBUM SUBLIMATUM. *Lond.*
Sublimed White Arsenic.

Reduce white arsenic to powder; then put it into a crucible; apply heat, and sublime it into another crucible inverted over the former.

THE white oxide of arsenic of commerce is obtained as an insignificant product in roasting cobalt ores, and is therefore often impure. Notwithstanding the low price of arsenic, it is sometimes adulterated. Baumés says, that he found in fifty pounds, thirty of chalk. By sublimation, however, which, with a small quantity, may be performed in an oil-flask, it is easily separated from foreign matters, but the operator must be very careful to avoid the fumes which arise during the process.

Med. use.—Oxyde of arsenic is scarcely ever administered internally in this country; but Harless says, that it may be given with perfect safety in doses of the twelfth or eighth part of a grain.

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* *Syn.* Arsenicum album, Oxydulum arsenici album, Oxydum arsenici album, Arsenicum, Acidum arseniosum.

Off. Prep.—Liquor arsenicalis, *L. E. D.*

LIQUOR ARSENICALIS. *Dub.*
Arsenical Solution *.

Take of Sublimed white oxide of arsenic,
Salt of tartar, of each sixty grains;
Compound spirit of lavender, four fluidrachms;
Distilled water, half a pint.

Boil the oxide of arsenic and carbonate of potass together in the water in a glass vessel, until the oxide be dissolved. To the solution, when cold, add the compound spirit of lavender, and as much distilled water, that the whole solution shall amount to a pint measure.

Lond.

Take of Sublimed white arsenic, in very subtile powder,
Subcarbonate of potass from tartar, of each sixty-four grains;
Compound spirit of lavender, four fluidrachms;
Distilled water, a pint.

Boil the white arsenic and subcarbonate of potass with the water in a glass vessel, until the arsenic be entirely dissolved. Add to the solution, when cold, the compound spirit of lavender. Lastly, add as much more distilled water as will make the whole amount exactly to a pint.

SOLUTIO ARSENICALIS. *Ed.*
Solution of Arsenic.

Take of Oxide of arsenic in very fine powder,
Pure subcarbonate of potass, of each sixty-four grains;
Distilled water, fourteen ounces.

Boil together in a glass vessel, with a gentle fire, until the whole oxide be dissolved. To the liquor, when cold, add,
Compound spirit of lavender, half an ounce;
Distilled water, as much as will make the whole solution amount to sixteen ounces.

THIS preparation is a solution of arsenite of potass, and corresponds with Dr Fowler's tasteless ague-drop. The spirit of lavender is added merely to prevent its being mistaken for water, an accident which might happen from its want of colour and taste. It may also preserve it from decomposition, as stated by Mr Hume. Now that arsenic is so much used, it is useful to have an officinal solution of an uniform strength.

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* *Syn.* Solutio arsenicalis Fowleri, Solutio acidi arsenicosi, Sol. arsenitis potassæ, Sol. arsenitis kalici, Sol. kali arsenicosi.

The Dublin College have diminished the quantity of arsenic by one-sixteenth part, on grounds which, as stated by Dr Barker, are quite unsatisfactory, to save the apothecary the trouble of weighing, with two pieces of metal, sixty-four grains, instead of one drachm, with one. Dr Powell has justly observed, that " where the dose is small, and the effects so powerful, the most minute attention to its proportion and preparation become necessary." A drachm of the solution contains one-half of a grain, and it will seldom be necessary to give above ten minims for a dose.

CHAP. VIII.—BISMUTH.

BISMUTHI SUBNITRAS. *Lond.*

Subnitrate of Bismuth *.

Take of Bismuth, one ounce;
Nitric acid, one fluidounce and a half;
Distilled water, three pints.

Mix six fluidrachms of the distilled water with the nitric acid, and dissolve the bismuth in them. Add the rest of the water to the filtered liquor, and set it at rest till the powder subside. Then decant the supernatant liquor, and wash the subnitrate of bismuth with distilled water, and dry it, wrapped up in bibulous paper, with a gentle heat.

Dub.

Take of Bismuth in powder, seven parts;
Dilute nitric acid, twenty parts;
Distilled water, one hundred parts.

Gradually add the bismuth to the acid, and dissolve by the assistance of heat. Mix the solution with the water, and set it at rest that the precipitate may subside. Wash this with distilled water, and dry it upon blotting paper with a gentle heat.

THE preparation of the Magistery of bismuth as a cosmetic, was a profitable secret in the family of Nicholas Lemery. In the beginning of the 18th century it became public; and about 1800 Bucholz and Rose explained its real nature. Till that time the precipitate had been considered to be an oxide.

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* *Syn.* Busmuthum nitricum præcipitatum, Bismuthum subnitricum præcip. Nitras bismuthi præc. Magisterium marcasitæ, Magisterium bismuthi.

Bismuth dissolves readily in dilute nitric acid, with the evolution of nitric oxide gas. The solution is colourless, and by evaporation yields colourless crystals obliquely rhomboid. The solution is decomposed by the addition of more than a certain proportion of water. It becomes milky, and lets fall a fine crystalline powder of a brilliant white colour. That this is a subnitrate is proved by its emitting nitrous fumes when acted upon by sulphuric acid. In solution there remains a binitrate of bismuth, which may be obtained in crystals.

To succeed in this preparation the metal must be added to the acid gradually, otherwise the action is too violent; the acid must be fully saturated, which is known when on the addition of the last bit of bismuth, some white powder remains undissolved. It is then gradually added with constant stirring to a quantity of water equal to 15 times the weight of the metal dissolved. The precipitate must be quickly separated, washed twice with distilled water, and dried as speedily as possible, otherwise it concretes into a crystalline mass, and loses the lightness and smoothness for which it is esteemed.

The dinitrate of bismuth is commonly in the state of a tasteless and inodorous, white, minute, crystalline, spongy, powder, but may be procured in more evident prismatic crystals. When first prepared and still moist, it is soluble in a large quantity of water; after drying it becomes almost insoluble. It loses its acid and is vitrified yellow by heat, and blackened by light and sulphuretted hydrogen, especially if moist. It is readily soluble in concentrated acids, and sparingly soluble in solution of potass or soda, and more abundantly in ammonia.

Med. use.—The medical virtues of this preparation are uncertain. It has been considered as antispasmodic. Odier of Geneva gave it in gastrodynia in doses from 1—12 grains, but recommended smaller doses at first, as with some it produced nausea, disposition to vomit, anxiety and vertigo. It was made known in this country by the late Dr Marcet, and the most accurate reports of its virtue have been given by Dr Bardesley. It is blackened in passing through the bowels. I consider it, in point of medical virtue, equivalent with the oxide of zinc.

CHAP. IX.—COPPER.

CUPRI SUBACETAS PRÆPARATUM. *Dub.*
Prepared Subacetate of Copper *.

Let the subacetate of copper be ground to powder, and the minute particles be separated in the manner directed for preparation of chalk.

THE intention of this process is merely to obtain the verdegris in the state of the most minute mechanical division, but the intention is not attained by the means prescribed, as the verdegris is decomposed by the water employed. According to Mr Phillips, the verdegris of commerce is a hydrated acetate, consisting of peroxide of copper, 80; acetic acid, 50, and water 54 = 184. By the action of water it is resolved into a binacetate, which is dissolved, and a green precipitate, consisting of two atoms of peroxide of copper, 160, and one of acetic acid, 50 = 210. This is the prepared verdegris of the pharmacopœias; but to obtain it really unaltered, verdegris must be levigated without the addition of water.

Off. Prep.—Oxymel cupri subacetatis, *D.* Unguentum cupri subacetatis, *D.*

SOLUTIO SULPHATIS CUPRI COMPOSITA. *Ed.*
Compound Solution of Sulphate of Copper.

Take of Sulphate of copper,
Alum, of each three ounces;
Water, two pounds;
Sulphuric acid, an ounce and a half.

Boil the sulphates in the water to dissolve them, and then add the acid to the liquor filtered through paper.

IN this preparation, the substances dissolved in the water exert no chemical action on each other, and the composition was probably contrived, from the false idea, that the sum of the powers of substances having similar virtues was increased by mixing them with each other.

Med. use.—It is chiefly used as a styptic for stopping bleedings at the nose and from other passages; and, for this purpose, cloths, or dossils, steeped in the liquor, are to be applied to the part.

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* *Syn.* Oxydum cupri per acidum vegetabile, Subacetis cupri, Viride æris, Cuprum subaceticum.

AMMONIARETUM CUPRI. *Ed.*

Ammoniaret of Copper *.

Take of Pure sulphate of copper, two parts;
Subcarbonate of ammonia, three parts.

Rub them carefully together in a glass mortar, until, after the effervescence has entirely ceased, they unite into a violet-coloured mass, which must be wrapped up in blotting paper, and dried first on a chalk stone, and afterwards by a gentle heat. The product must be kept in a glass phial, well corked.

CUPRUM AMMONIATUM. *Dub.*

Ammoniated Copper.

Take of Sulphate of copper, two parts;
Carbonate of ammonia, three parts.

Triturate them in an earthenware mortar, until, after the effervescence has entirely ceased, they unite into a mass, which is to be wrapped up in bibulous paper, dried, and kept in a phial, closed with a glass-stopper.

Lond.

Take of Sulphate of copper, half an ounce;
Subcarbonate of ammonia, six drachms.

Rub them together in a glass mortar, until the effervescence cease; then dry the ammoniated copper, wrapped up in blotting paper, with a gentle heat.

ON triturating these substances together, a reaction takes place: there is a kind of effervescence from the extrication of great part of the carbonic acid gas, and the compound becomes gradually moist. Such a phenomenon is by no means uncommon, and arises from the quantity of water of crystallization contained in the ingredients being greater than what is required in the new compound formed. As soon, therefore, as the ingredients begin to act upon each other, a quantity of water is set at liberty, which renders the mass moist.

The nature of this compound, and consequently the name which should be given it, are not yet sufficiently ascertained. Prepared according to the directions of the colleges, it evidently contains oxide of copper, ammonia, and sulphuric acid. If these substances be chemically combined, which is probable, as it may be obtained in fine prismatic crystals, it should be denominated the Subsulphate of copper and ammonia, although there is probably great excess of ammonia. By exposure to the air during its exsiccation, and by keeping, it is apt to lose its transparent blue colour entirely, and become opaque green. It should therefore be prepared in small quantities at a time.

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* *Syn.* Cuprum sulphurico-ammoniatum, Sulfas cupri ammoniacalis, Cuprum ammoniacale vitriolicum, Sulphas cupri et ammoniæ, Deutosulphas cupri et ammoniæ, Subsulphas ammoniaco-cupricum.

Med. use.—Ammoniaret of copper has been strongly recommended in epilepsy; but, from its good effects sometimes ceasing after it has been used for some time, a want of success, in some cases, and the disagreeable consequences with which its use is sometimes attended, it has not lately been much prescribed. In my practice, however, its success has often exceeded my expectations. It is exhibited by beginning with doses of half a grain twice a-day, and increasing them gradually to as much as the stomach will bear. Dr Cullen sometimes increased the dose to five grains.

Off. Prep.—Cupri ammoniati aqua, *D.*

CUPRI AMMONIATI AQUA. *Dub.* LIQUOR CUPRI AMMONIATI. *Lond.*

Solution of Ammoniated Copper *.

Take of Ammoniated copper, one drachm, *L.*; one part, *D.*;
Distilled water, one pint, *L.*; one hundred parts, *D.*

Dissolve the ammoniated copper in the water, and filter through paper.

FROM the large quantity of water employed, one half of the ammoniaret of copper is decomposed, and the oxide is precipitated. Mr Phillips found, that one-fourth of the water used, or even less, was sufficient for the solution of the ammoniaret.

Med. use.—The solution is applied externally for cleaning foul ulcers, and disposing them to heal. It has been recommended also for taking off specks and films from the eyes; but, when used with this intention, it ought to be diluted with some pure water, as in the degree of strength in which it is here ordered, it irritates and inflames the eyes considerably. It is the readiest, and, perhaps, the most delicate, test of arsenic, by which its blue colour is converted into Scheele's green.

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* *Syn.* Aqua ophthalmica cœrulea, Liquor ophthalmicus cœruleus, Aqua cupri ammoniaci, Aqua ophthalmica sapphirina.

CHAP. X.—IRON.

LIMATURA FERRI PURIFICATA. *Ed.*

Purified Filings of Iron[*].

Place a sieve over the filings, and apply a magnet, so that the filings may be attracted upwards through the sieve.

THIS process does not fulfil the purpose for which it is intended; for the adhesion of a very small particle of iron renders brass and other metals attractable by the magnet. The filings of iron got from the shops of different artificers, which are always mixed with solder, and other metals, cannot be purified in this way, so as to render them fit for internal use; and, indeed, I have great doubts that the process is practicable. The only way filings can be obtained sufficiently pure is by filing a piece of pure iron with a clean file. On the continent, the filings of iron are, for some purposes, reduced into the state of impalpable powder, by dry porphyrization.

Med. use.—They may be given internally, in doses of five grains and upwards, but their solution in the stomach generally produces nidorous eructations.

Off. Prep.—Sulphas ferri, *E.* Tartras potassæ et ferri, *E.*

OXIDUM FERRI NIGRUM PURIFICATUM. *Ed.*

Purified Black Oxide of Iron.

Let the scales of the oxide of iron, which are to be found at the foot of the blacksmith's anvil, be purified by the application of a magnet, which will attract only the smaller and purer scales.

FERRI OXYDUM NIGRUM. *Dub.*

Black Oxyde of Iron [†].

Wash with water the scales of oxyde of iron gathered at a blacksmith's forge, and when dry separate them from foreign matters by means of a magnet. Then reduce them to powder, of which the finest particles are to be collected in the manner directed for the preparation of chalk.

HERE the application of the magnet, if the process be practicable, might be useful, because these scales contain no foreign metal, but are mixed with earthy and other impurities, which could be separated in no other way. The scales of iron are far from being a perfect protoxide, and when acted upon in the stomach by its juices, give rise to the evolution of hydrogen gas and unpleasant nidorous eructations.

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[*] *Syn.* Ferrum pulveratum, Limatura martis depurata, Ferrum solidum, Limatura chalybis.

[†] *Syn.* Ferrum oxydulatum nigrum, Protoxydum ferri, Oxydum ferro-ferricum, Æthiops martialis.

In the French Codex, there are no fewer than three methods of preparing the black oxide of iron, of which the following, invented by Guibourt, is followed in the laboratory of the hospitals of Paris:

Take of filings of iron any quantity; triturate them in a mortar, then put them in a wide vessel of porcelain, and pour upon them water until it come off perfectly clear. Compress the filings, and incline the vessel, and let them drop for some minutes. Replace the vessel in its horizontal position; stir the filings with an iron spathula, and add as much water as will moisten them. In the course of four or five days wash off the oxide, let it subside, and collect it on a filter. Lastly, dry it in a furnace after compressing it.

It is necessary to take care that the filings be always kept mixed with the same quantity of water, so that they neither cease to be moist, nor allow water to flow off when the vessel is inclined. If this be attended to, in a short time there will be an evolution of sulphuretted hydrogen, recognisable by its odour; and during the first day the mass will heat, in consequence of the combination of the oxygen with the iron, to 86° Fahr., next day to 97° Fahr., and on the third nearly to 122° Fahr., above which it will not rise. To maintain this temperature, the mass must be frequently stirred, and care taken that it be neither too little nor too much moistened, otherwise the process will go on unequally. In the course of five days great part of the iron is converted into oxide, and the heat falls. Then the mass is to be elutriated to remove the oxide. The residuary iron may be treated in the same manner, will again heat, and may be elutriated after the same number of days. In this manner a great quantity of black oxide of iron may be prepared in a few days. In a note affixed to Ratier's translation, it is stated, that, besides the hydrogen gas, which is produced when water is decomposed, there is evolved a little ammonia, and perhaps some protoxide of azote, showing that the air acts during this oxidation.

Med. use.—The protoxide of iron is very little used in this country, probably on account of the very imperfect manner in which it has hitherto been prepared. But I am inclined to think that it is one of the best forms of iron. It is more soluble in all menstrua than the peroxide, and it is less active than the sulphate, while it has not the inconveniences of metallic iron.

Off. Prep.—Tinctura muriatis ferri, *E.*

SUBCARBONAS FERRI PRÆPARATUS. *Ed.*
Prepared Subcarbonate of Iron *.

Moisten purified filings of iron frequently with water, that they may be converted into rust, which is to be ground into an impalpable powder.

FERRI RUBIGO. *Dub.*
Rust of Iron.

Take of Iron-wire any quantity. Cut it into pieces, which are to be moistened frequently with water, and exposed to the air until they be corroded into rust. Then triturate them in an iron mortar, and by pouring water upon them, wash over the finest part of the powder, which is to be dried.

IRON is one of the most easily oxidized of the metals. By exposure at the same time to air and moisture, it is very quickly oxidized, while it also absorbs carbonic acid, and is converted into a reddish-brown pulverulent substance, well known by the name of Rust of iron. For medical use it is prepared by trituration and elutriation.

Off. Prep.—Muriatis ferri liquor, *D.*

CARBONAS FERRI PRÆCIPITATUS. *Ed.*
FERRI CARBONAS. *Dub.*
Precipitated Carbonate of Iron †.

Take of Sulphate of iron, four ounces, *E.*; twenty-five parts, *D.*;
Subcarbonate of soda, five ounces, *E.*; twenty-six parts, *D.*;
Water, ten pints, *E.*; eighty parts, *D.*

Dissolve the sulphate in the water, and add the carbonate of soda previously dissolved in a sufficient quantity of water, and mix them thoroughly.

Wash the precipitated carbonate of iron, with warm water, and afterwards dry it.

FERRI SUBCARBONAS. *Lond.*
Subcarbonate of Iron.

Take of Sulphate of iron, eight ounces;
Subcarbonate of soda, six ounces;
Boiling water, a gallon.

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* *Syn.* Ferrum oxydatum fuscum, Oxydum ferri fuscum, Subdeutocarbonas ferri, Subcarbonas ferroso-ferricum, Crocus martis aperitivus.

† *Syn.* Ferrum oxydatum hydraticum, Hydras ferricum.

Dissolve the sulphate of iron and subcarbonate of soda separately, each in four pints of the water; mix the solutions, and set aside until the precipitate subside; then, having poured off the supernatant liquor, wash the subcarbonate of iron with warm water, and dry it wrapped up in bibulous paper, with a gentle heat.

On mixing the solutions of these salts together, there is an immediate mutual decomposition, Sulphate of soda is formed, which remains in solution, and carbonate of iron, which is precipitated of a green colour. The precipitate, when first formed, is the carbonate of black oxide of iron, or contains the iron in the state of protoxide, the state in which it exists in the green sulphate of iron; but in the process of drying, it absorbs more oxygen, becomes of a red colour, and part of it is converted into red oxide of iron. As the precipitate is extremely light and bulky, it is not easily separated by allowing it to subside, and pouring off the clear liquor; filtration should therefore be employed. The carbonate of soda is used on account of the greater solubility of sulphate of soda than of sulphate of potass, which renders the subsequent ablution of the salt more easy.

The Edinburgh College use five ounces of the alkaline salt, the London only three, to decompose four of the chalybeate. The Dublin 26 to 25, which Dr Barker found to be quite sufficient.

Mr Phillips found very great differences in the results from very slight differences in conducting the process; and he concludes, that it is more economical to use hot water in every part of the process, and to use potass instead of soda in the preparation.

Subcarbonate of iron, when well prepared, is a powder of a reddish-brown colour, readily soluble in acids, and, according to Mr Phillips, yielding about 15 *per cent.* carbonic acid. When imperfectly prepared it contains much less carbonic acid, and is not so soluble, and its colour is deeper red. Mr Phillips conjectures, with great probability, that it will be more active as a medicine in proportion to the quantity of carbonic acid it contains. Attention to its mode of preparation is therefore of great importance.

Med. use.—The carbonate of iron is an excellent and safe chalybeate. It may be given in doses of from five grains to sixty; but all chalybeates answer better in small doses, frequently repeated, than in large doses.

The carbonate and some other preparations of iron were strongly recommended some years ago, both externally and internally, for the cure of cancer, but the cases in which they succeeded were probably spurious, as they have often failed in true cancer. In the treatment of neuralgia, its exhibition, as first proposed by Mr B. Hutchinson, has been more successful, and has now became an established practice. He gives from half a drachm to four scruples three times a-day. Besides the remission of the paroxysm, no very obvious effects are produced.

Off. Prep.—Ferri acetas, *D.* Tinctura muriatis ferri, *L.* Ferrum ammoniatum, *L.*

FERRI SULPHAS. *Ed.*

Sulphate of Iron [*].

Take of Purified filings of iron, six ounces;
Sulphuric acid, eight ounces;
Water, two pounds and a half.

Mix them, and after the effervescence ceases, digest the mixture for some time upon warm sand; then strain the decanted liquor through paper, and after due evaporation set it aside to crystallize.

Dub.

Take of Iron-wire, four parts;
Sulphuric acid, seven parts;
Water, sixty parts.

Dissolve the metal by the aid of heat, and filter the liquor through paper. Lastly, set aside the liquor, after due evaporation, to crystallize by slow refrigeration.

Lond.

Take of Iron,
Sulphuric acid, each eight ounces by weight;
Water, four pints.

Mix the sulphuric acid with the water in a glass vessel, and add the iron; when the effervescence has ceased, strain the solution through paper, and after due evaporation set it aside to crystallize. Pour off the liquid, and dry the crystals on blotting paper.

SULPHATE of iron cannot be procured perfectly pure, except by the direct union of sulphuric acid and iron.

Iron acts with great rapidity on diluted sulphuric acid; in which case it is oxidized by decomposing the water, and therefore the hydrogen of the water is separated in the form of gas. The action of the acid and iron upon each other often ceases before the acid is nearly saturated, and may be renewed by the addition of a little water. The reason is, that all the water which was not decomposed is employed to dissolve the sulphate of iron formed.

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[*] *Syn.* Ferrum sulphuricum crystallizatum, Protosulphas ferri, Sulphas ferrosum cryst. Vitriolum viride, Vitriolum martis.

Med. use.—The properties and uses of sulphate of iron have been already mentioned.

Off. Prep.—Tinctura muriatis ferri cum alcohol, *D.* Mistura ferri comp. *D.*

SULPHAS FERRI EXSICCATUS. *Ed.*
Dried Sulphate of Iron.

Take of Sulphate of iron any quantity.

Expose it to the action of a moderate heat in an unglazed earthen vessel, until it become white and perfectly dry.

THE heat applied here must not be so great as to decompose the sulphate of iron, but only to deprive it of its water of crystallization, about 20 *per cent.* In this state it may be used for obtaining crystallized acetic acid, by decomposing a dry acetate.

Off. Prep.—Oxidum ferri rubrum, *E.*

OXIDUM FERRI RUBRUM. *Ed.*
Red Oxide of Iron *.

Expose dried sulphate of iron gradually to an intense heat, until it is converted into a very red substance.

Dub.

Expose sulphate of iron to heat, until the water of crystallization be expelled; then roast it by an intense fire, as long as acid vapour is evolved. Wash the red oxide, until, according to the test of litmus, the water decanted from it be free of acid; lastly, dry it on blotting paper.

THE Dublin College unites these two processes of the Edinburgh into one. When heat is applied to crystallized sulphate of iron, it undergoes a certain degree of watery fusion; it then swells up, emits vapour, and becomes dry and of a grey colour. Crystallized sulphate contains 36 protoxide of iron, 40 acid, and 63 water. By the process described, part of the water is expelled, and no other change should be produced.

On raising the heat the salt itself is decomposed, the iron is converted from the protoxide into the peroxide, and an equivalent quantity of sulphuric acid is converted into sulphurous. If the heat be continued and raised after the metal is peroxidized, great part of the remainder of the sulphuric acid is expelled unchanged, and there remains only peroxide of iron, with a small quantity of adhering sulphuric acid, which is easily removed by washing. This process was formerly employed in this country, and still is in Germany, for the preparation of sulphuric acid, called Nordhausen; which, however, from the presence of the sulphurous acid, is possessed of some peculiar properties, such as emitting fumes and crystallizing.

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* *Syn.* Ferrum oxidatum fuscum, Crocus martis aperitivus, Sulphas ferri calcinatus, Colcothar vitrioli, Ferrum oxydatum subsulphuricum.

The residuary colcothar, when washed, should have a red brown verging into liver colour, and should be in fine powder, inodorous, insipid, not deliquescent and insoluble. It should not effervesce on the addition of muriatic acid, and when dissolved in it, should not deposit copper on bright iron immersed in it, and should only show a slight turbidness with liquid muriate of baryta.

Off. Prep.—Emplast. oxydi ferri rubri, *E. D.*

TINCTURA MURIATIS FERRI. *Ed.*

Tincture of Muriate of Iron [*].

Take of Purified black oxide of iron in powder, three ounces;
Muriatic acid, about ten ounces, or as much as may be sufficient to dissolve the oxide.

Digest by a gentle heat, and after the powder is dissolved, add of alcohol, as much as will make the whole quantity of liquor amount to two pounds and a half.

Lond.

Take of Subcarbonate of iron, half a pound;
Muriatic acid, a pint;
Rectified spirit, three pints.

Pour the acid upon the subcarbonate in a glass vessel, and shake it occasionally for three days. Set it aside, that the dregs, if any, may subside. Pour off the clear liquor, and add to it the spirit.

MURIATIS FERRI LIQUOR. *Dub.*

Liquor of Muriate of Iron.

Take of Rust of iron, one part;
Muriatic acid,
Rectified spirit, of each six parts.

Pour the muriatic acid on the rust in a glass vessel, and shake the mixture occasionally during three days. Then set it by, that the fæces may subside, and pour off the pure liquor; evaporate this slowly to one-third, and when cold, add the spirit.

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[*] *Syn.* Tinctura ferri muriatici, Tinctura martis aurea, Tinctura muriatis ferri alcoholisatus.

Muriatic acid is capable of combining either with the black or red oxide of iron, and forms with each salts having distinctive properties. The permuriate of iron, which is the object of this process, is not crystallizable; has a dark orange colour; is deliquescent and soluble in alcohol; forming a permanent brown-red solution, having a very astringent taste.

In making this preparation, the colleges use iron in a different state; the Edinburgh, the black oxide; the Dublin, the rust; and the London, the carbonate. When the black oxide is used, there will be little evolution of gas, and the solution will be at first chiefly protomuriate, but it soon attracts oxygen gas from the atmosphere, and becomes permuriate. When the carbonate is used, there is an effervescence of carbonic acid gas, and the solution is a mixture of protomuriate and permuriate, which is not permanent. Mr Phillips found that the proportions of the London College answered extremely well, and the tincture had a sp. gr. of 0.994, and contained 16.8 grains of peroxide of iron in half a fluidounce. The process of the Dublin College differs from that of the others, in evaporating the muriatic solution to one-third before adding the spirit. The object is to remove the superfluous acid.

This tincture has a deep reddish brown-colour, an etherial smell, and an extremely styptic taste. It is decomposed by all the alkalies, earths, and their carbonates, and strikes a black or green colour with vegetable astringents.

Med. use.—It is an excellent chalybeate, and may be given in doses of ten or twenty drops twice or thrice a-day, in any proper vehicle. It is chiefly exhibited in scrofula as a tonic, often in combination with muriate of lime, or of baryta; as a styptic internally and externally in hæmorrhagies; and as a specific in dysuria, given in doses of ten drops every ten minutes, until a sensible effect be produced.

MURIAS AMMONIÆ ET FERRI. *Ed.*

Muriate of Ammonia and Iron [*].

Take of Red oxide of iron, washed and again dried,
Muriate of ammonia, of each equal weights.

Mix them thoroughly, and sublime with a quick fire. Triturate the sublimed matter, and preserve it in a very close phial.

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[*] *Syn.* Ammonium muriaticum martialum, Murias ferri ammoniacalis, Flores salis ammoniaci martialis, Murias ammonico-ferricum.

FERRUM AMMONIATUM. *Lond.*
Ammoniated Iron.

Take of Subcarbonate of iron,
Muriatic acid,
Muriate of ammonia, of each a pound.

Pour the muriatic acid on the subcarbonate of iron, and set it aside until no more gas escape; filter through paper, and evaporate to dryness; immediately mix the residuum intimately with the muriate of ammonia, and sublime with an intense heat; and, lastly, reduce the sublimate to powder.

THIS is a very uncertain and unequal preparation, and has been rejected from the recent edition of the Dublin Pharmacopœia. Although, at a low temperature ammonia decomposes the muriate of iron, at a high temperature iron and its oxides decompose muriate of ammonia. But as muriate of ammonia is itself a volatile salt, great part of it rises undecomposed; so that the product of the process of the Edinburgh College is a mixture of muriate of ammonia with red muriate of iron. The decomposition is here effected by simple affinity. As soon as the oxide of iron acts on the muriate of ammonia, the ammonia which is separated escapes; then, as the heat increases, undecomposed muriate of ammonia is sublimed; which, as the process advances, is mixed with an increasing proportion of muriate of iron. In the process of the London Pharmacopœia permuriate of iron is first formed and then sublimed with muriate of ammonia.

When sublimation is employed, the heat must be applied as quickly as possible; and the sublimed product thoroughly mixed by trituration, and kept in well-stopt glass vessels. It should have a deep orange-colour, and a smell resembling saffron, and should deliquesce in the air.

As the product by sublimation is always uncertain, the French Codex merely evaporate to dryness a mixture of three parts of muriate of ammonia and one of muriate of iron, after having dissolved them in a sufficient quantity of water.

Med. use.—This preparation is supposed to be highly aperient and attenuating, by virtue of the saline matter joined to the iron. It has been found of service in hysterical and hypochondriacal cases, and in distempers proceeding from a laxity and weakness of the solids, as the rickets. From two or three grains to ten may be conveniently taken in the form of a bolus.

TINCTURA FERRI AMMONIATI. *Lond.*

Tincture of Ammoniated Iron.

Take of Ammoniated iron, four ounces;
Proof spirit, one pint.
Macerate and strain.

THIS is merely a spiritous solution of the preceding article, and agrees in its effects with the tincture of muriate of iron, but is supposed to be more penetrating and diffusible.

TARTRAS POTASSÆ ET FERRI. *Ed.*

Tartrate of Potass and Iron *.

Take of Purified filings of iron, one part;
Supertartrate of potass, in powder, two parts;
Water, one part.

Triturate together and expose to the air in an earthen vessel for fifteen days, stirring the mixture daily with a spatula, and adding water from time to time to keep the mass always moist. Then boil the mass for a short time in four times its weight of distilled water, and pour off the solution from its dregs. Evaporate the solution in the heat of a water-bath to dryness, and grind the mass into powder, which is to be kept in very close phials.

FERRUM TARTARIZATUM. *Lond.*

Tartarized Iron.

Take of Iron, one pound;
Supertartrate of potass, in powder, two pounds;
Distilled water, five pints, or as much as may be sufficient.

Triturate together the iron and supertartrate of potass, and expose in a flat glass vessel, with a pint of the water, for twenty days, adding from time to time distilled water to keep it constantly moist. Then boil it with four pints of distilled water for a quarter of an hour, and filter; evaporate in a water bath until the tartarized iron be completely dried. Rub this to powder, and keep it in a well-corked vessel.

FERRI TARTARUM. *Dub.*

Tartar of Iron.

Take of Iron wire, one part;
Bitartrate of potass, in very fine powder, four parts;
Distilled water, eight parts, or what may be required.

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* *Syn.* Tartarus chalybeatus, Tartras kalico-ferricum, Globuli martialis, Globuli Nanceani.

Mix them together and expose them to the air in a wide vessel for fifteen days. Stir the mixture from time to time, and by adding fresh water daily, keep it always moist, taking care that the iron is never totally covered by the water. Lastly, boil it in a sufficient quantity of distilled water, and evaporate the filtered liquor in a water bath to dryness. Keep the tartrate of iron in a well-closed phial.

This is a triple salt, consisting of one equivalent of tartrate of iron, 182, one of tartrate of potass, 114, and two of water, 18=234. In the process prescribed for its formation, the iron is gradually oxidated from the decomposition of the water and air. While some hydrogen gas is evolved, the whole of the iron and tartar disappear, and a compound is formed which is not crystallizable, when dried is of a dark greenish-brown colour, and attracts moisture from the atmosphere, but does not deliquesce, is exceedingly tenacious, resembling gum, and can scarcely be made to form a perfect solution. Mr Phillips therefore recommends that the tartrate should be dissolved as soon as it is formed, and kept in the state of solution; for when perfect it cannot be given in the state of powder, on account of its attracting moisture, and after being dried, it does make a perfect solution. Seven times its weight of water easily dissolves the tartarized iron by trituration, and the solution readily passes through the filter, and contains one-eighth part of its weight of tartarized iron, or nearly 16 grains of oxide in the fluidounce. This solution is of a deep greenish-brown colour, remains for a great length of time without undergoing any change, except at first depositing the tartrate of lime existing in the tartar. It is precipitated by alcohol, and decomposed by lime-water, by solutions of potass and soda; and by their subcarbonates, when heated, but not by ammonia or its subcarbonate, hot or cold.

The only difference deserving of notice in the formulas of the Colleges is, that that of Dublin uses only one-half of the iron prescribed by the others, and in this respect it agrees with the best foreign pharmacopœias. In the Parisian Codex, in making the *Globuli martiales*, weak spirit is used instead of water for moistening the mass. Also after the mixture has been made and stirred for five or six days, it is directed to be heated to about 170° Fahr. and repeatedly stirred. When it has got the consistency of thick honey, fresh spirit is to be added, and the mixture to be again inspissated. This is to be repeated again and again until the mass has lost entirely its metallic splendor, and acquired a perfectly black colour. It is then evaporated to dryness, and made up into balls.

Med. use.—This is one of the most agreeable forms of giving iron, and when fully saturated, has less of the chalybeate taste than any other. It is therefore conveniently given to children and chlorotic females. Its solubility probably renders it efficacious in a smaller dose.

VINUM FERRI. *Lond.*
Wine of Iron *.

Take of Iron, one drachm;
Supertartrate of potass, in powder, six drachms;
Distilled water, two pints, or as much as may be necessary;
Proof spirit, twenty fluidounces.

Triturate together the iron and supertartrate of potass; and expose in an open glass vessel with a fluidounce of water to the air for six weeks, stirring the mass daily with a spatula, and adding distilled water occasionally to keep it moist. Then dry with a gentle heat, rub to powder, and mix with thirty ounces of distilled water. Filter the liquor, and add to the filtered liquor the spirit.

CHALYBEATE wine was originally prepared by infusing iron wire in wine, and although an unequal, it was a good and useful preparation. The iron was first oxidized, and then dissolved in the wine by means of the supertartrate of potass it contained. According to Mr Phillips, a pint of sherry dissolves, if soft iron be used, about twenty-two grains of peroxide. In the formula of the London College, a much more uniform and perfect article is obtained. A tartrate of iron and potass is first prepared in the usual way, dried and dissolved in water, to which a proportion of alcohol is added. Mr Phillips finds that a pint of this new preparation contains only 16 grains of peroxide. It is a solecism in language to retain the appellation of *Vinum* for this preparation: it should be *Solutio.*

Med. use.—The dose is from a drachm to half an ounce, repeated twice or thrice a-day, in chlorotic cases.

FERRI ACETAS. *Dub.*
Acetate of Iron.

Take of Carbonate of iron, one part;
Acetic acid, six parts;
Digest for three days, and filter.

THE Dublin College seems to be very partial to combinations of iron with acetic acid, although uncertain preparations, whose constitution is not yet ascertained.

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* *Syn.* Vinum martiale, Vinum chalybeatum.

Dr Perceval found, that in experiments made to determine the comparative solubility of iron in its different states in acetic acid, that two drachms of the acid, sp. gr. 1065, acquired a light amber tinge from ten grains of scales of iron, and left a residuum of 9½; a reddish amber colour from iron-filings, residuum 6¾; a light red from the red oxide, residuum 8¾; and from the precipitated carbonate a deep claret colour, and the whole was dissolved. Hence the last was preferred for making directly an acetate of iron.

TINCTURA ACETATIS FERRI. *Dub.*
Tincture of Acetate of Iron.

Take of Acetate of potass, two parts;
Sulphate of iron, one part;
Rectified spirit of wine, twenty-six parts.

Rub the acetate of potass and sulphate of iron in an earthenware mortar, until they unite into a mass; then dry it with a moderate heat, and triturate it, when dried, with the spirit. Digest the mixture in a well-corked phial for seven days, shaking it occasionally. Lastly, after the fæces have subsided, pour off the tincture, and keep it in a well-corked phial.

IN this process double decomposition takes place, sulphate of potass and acetate of iron are formed. The former being insoluble in alcohol, is very sparingly dissolved in the spirit; and as the iron in the sulphate, though in the state of black oxide, has a strong attraction for oxygen, it is probable that the acetate prepared in the way directed is a mixed acetate.

This tincture, if made with equal parts of the salts and with rectified spirit, grows turbid by keeping, and deposites an oxide of iron. This does not happen when alcohol, sp. gr. 0.815, is employed. But Mr Watts discovered, that by using two parts of acetate of potass to one of sulphate of iron, a permanent tincture may be extracted by rectified spirit. This has been adopted by the College. It contains acetate of potass as well as of iron, for its extract is whitish, from a predominance of the former. A drachm measure gave gr. $\frac{16}{20}$ of prussiate of iron, by precipitation.

Med. use.—It has an extremely styptic taste, and is given in doses of thirty or forty drops.

Dr Perceval says it is an elegant, agreeable, and useful chalybeate preparation, of which a tea-spoonful or two may be conveniently taken in asses milk.

TINCTURA ACETATIS FERRI CUM ALCOHOL. *Dub.*

Tincture of Acetate of Iron with Alcohol.

Take of Acetate of potass,
Sulphate of iron, of each one ounce;
Alcohol, two pints;

Rub the acetate of potass and sulphate of iron in an earthenware mortar until they unite into a soft mass; dry this with a moderate heat, and as soon as it has cooled triturate it with the alcohol. Digest the mixture in a well-corked phial for twenty-four hours, shaking it occasionally. Lastly, after the dregs have subsided, pour off the liquid liquor, and keep it in a close phial.

THE strong alcohol, used in this preparation, is incapable of dissolving the green salts of iron, but dissolves the red salts readily. This tincture contains a very pure peracetate of iron, more perfectly neutralized than most metallic salts, and is more permanent than the preceding. Its extract is of a beautiful crimson colour, which does not crystallize, but first assumes the consistence of wax, and then dries transparent, an ounce measure affording ten grains.

LIQUOR FERRI ALKALINI. *Lond.*

Solution of Alkaline Iron.

Take of Iron, two drachms and a half;
Nitric acid, two fluidounces;
Distilled water, six fluidounces;
Solution of subcarbonate of potass, six fluidounces.

Mix the water and acid, and pour them upon the iron. As soon as the effervescence has ceased, pour off the acid solution; add this gradually, and at intervals, to the solution of subcarbonate of potass, stirring it occasionally, until after having become of a dark red colour, no more effervescence be excited. Lastly, let it stand for six hours, and pour off the solution.

IN the first part of this singular process, the iron is oxidized and dissolved by the nitric acid, with the evolution of red fumes. In the second part, a solution of subcarbonate of potass is added, which at first precipitates percarbonate of iron, but on the further addition of the alkaline solution, the precipitate is redissolved, and a clear deep red solution is obtained, from which nitrate of potass crystallizes and is to be separated. The chemical nature of the composition has not been accurately ascertained, and the preparation is attended with considerable difficulty and uncertainty.

It has the inconvenience of being very easily decomposed, so that, according to Dr Paris, it cannot be exhibited in any form without decomposition; and Mr Phillips remarks, that if five parts of water be added to one of this preparation, in a few minutes the oxide of iron is almost entirely precipitated. In fact, it is a bad preparation, and should be rejected.

Med. use.—We have many examples of very unchemical compounds being very useful remedies; and in ascertaining the virtues of medicines, we must always have recourse to the test of experience. Dr Powell considers it as affording a combination of iron distinct from any other, and often applicable to practice; and adds, "If I was to speak individually of its powers, I should consider them as more considerable than those of any other preparation of the metal in many cases attended with debility of stomach, and it has been also prepared in some large shops, and not unfrequently employed."

CHAP. XI.— MERCURY.

HYDRARGYRUM PURIFICATUM. *Dub.*
Purified Quicksilver *.

Take of Quicksilver, six parts.
Draw off four parts by slow distillation.

Lond.

Put quicksilver in an iron retort, and by the application of heat, distil purified quicksilver.

Edin.

Take of Quicksilver, six parts;
Filings of iron, one part.
Rub them together, and distil from an iron vessel.

THE quicksilver of commerce is often adulterated with other metals, which renders it unfit either for internal use, or for some preparations. It therefore becomes necessary to purify it, and fortunately, its comparatively great volatility enables us to do this in a certain degree. The metals most commonly present are lead, zinc, tin and bismuth. From most of these it is easily purified by distillation, but bismuth is more apt than the others to rise along with the mercury. The London and Dublin Colleges distil it simply without any addition; the former drawing off the whole, the latter only two-thirds, lest towards the end of the process the mercury should elevate any impurities along with it. Sometimes additions are made with the view of retaining the foreign metals. Cinnabar was supposed to retain them by its sulphur, while its mercury increased the product. Iron filings are added by the Edinburgh College, but iron has little affinity with the injurious metals. It is probably useful, by rendering the ebullition more tranquil.

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* *Syn.* Hydrargyrus, Argentum vivum, Mercurius.

Mercury may be distilled in glass retorts. Iron retorts are the best, although strong earthen ones may also be used. The receiver may be of the same materials, or of glass, if we wish to inspect the progress of the operation; but, in this case, we must interpose an adopter between the retort and receiver, and fill the receiver nearly full of water, that the mercury may not crack it, by falling hot into it. The retort employed should be so large, that the quicksilver should not fill above one-third of it. The Parisian Codex directs, that a piece of wetted linen be tied over the mouth of the retort, to prevent loss. After the distillation is finished, the mercury is to be dried by squeezing it through shamoy leather.

Another mode of partially purifying quicksilver is by agitating it with strong sulphuric acid, which forms a saline powder with some of the baser metals, easily removed by washing and filtration. The thermometer-makers find it necessary to treat even distilled mercury in this way, and always obtain a saline powder.

Off. Prep.—Hydrargyri sulphuretum nigrum, *D. L. E.* Hydrarg. sulph. rubrum, *L. D.* Hydrarg. cum magnesia, *D.* Hydrarg. cum creta, *L. D.* Hydrarg. oxidum rubrum, *L. D.* Hydrarg. oxid. nitricum, *L. E. D.* Hydrargyri persulphas, *D.* Subsulphas hydrarg. flavus, *E. D.* Hydrarg. murias corrosiv. *L. E.* Calomelas sublimatum, *L. E. D.* Calomelas præcipitatum, *E. D.* Hydrarg. submurias ammon. *D.* Hydrarg. acetas, *D. E.* Pilulæ hydrargyri, *L. E. D.* Unguentum hydrargyri, *D. L. E.* Unguent. hydrarg. mitius, *D. L.* Unguent. hydrarg. nitratis, *D. L. E.* Unguent. hydrarg. nitrat. mitius, *E.* Emplast. ammoniaci cum hydrargyro, *D. L.*

HYDRARGYRUM CUM MAGNESIA. *Dub.*
Quicksilver with Magnesia.

Take of Purified quicksilver,
Manna, each two parts;
Carbonate of magnesia, one part.

Triturate the quicksilver with the manna, in an earthenware mortar, adding some drops of water, to give the mixture the consistence of a syrup, until the metallic globules become no longer visible. Then add, with constant trituration, an eighth part of the carbonate of magnesia. After they are thoroughly mixed, add sixteen parts of warm water, and shake the mixture; then let the liquor rest, and decant the fluid from the sediment as soon as it subsides. Repeat this washing twice, that the manna may be totally washed away, and with the sediment still moist, mix the remainder of the carbonate of magnesia. Lastly, dry the powder on blotting paper.

HYDRARGYRUM CUM CRETA. *Dub.*

Quicksilver with Chalk,

Is to be prepared in the same manner, only employing precipitated carbonate of lime instead of the carbonate of magnesia.

Lond.

Take of Purified quicksilver, by weight, three ounces;
Prepared chalk, five ounces.

Triturate them together until the globules disappear.

By long trituration with any viscid substance mercury loses its metallic splendour and other obvious physical properties. The mixture acquires a black or dark grey colour; and if the process be well performed, no metallic globules can be discovered even through a good lens. Still it is doubted whether the mercury, when thus extinguished or killed, be in the state of protoxide, or only in a state of minute mechanical division. Any substance that will prevent the mercury, when divided mechanically into globules, from reuniting, will effect this change in its appearance, whether dry and pulverulent, such as chalk, or viscid and saccharine, as manna, honey or syrup, or greasy, as lard or turpentine.

Although the Dublin Colleges uses manna in their processes, it is merely to facilitate the extinction of the mercury by means of its viscidity; for it is entirely washed away before the product is fit for use.

These powders have a grey colour, are partially soluble with effervescence in dilute acetic acid, forming solutions, in which magnesia or lime respectively are easily detected, while the dark grey residuum left by the acetic acid is soluble in dilute nitric acid, and may be detected by the usual reagents.

Med. use.—They are given as alteratives to children who have disordered bowels, or are suspected of predisposition to hydrocephalus. From three to four grains of either are given for a dose, and the magnesian or calcareous compound is selected, as the bowels are constipated or loose.

OXIDUM HYDRARGYRI CINEREUM. *Ed.*

Ash-coloured Oxide of Quicksilver *.

Take of Submuriate of mercury, half an ounce;
Lime water, five pounds.

Boil the submuriate in the lime water for a quarter of an hour in a lightly covered vessel. After it settles, pour off the liquor, and wash the oxide with distilled water, and then dry it.

Lond.

Take of Submuriate of quicksilver, one ounce;
Lime-water, one gallon.

Boil the submuriate of quicksilver in the lime-water, with constant stirring, until the grey oxide of mercury subside; wash this with distilled water, and then dry.

HYDRARGYRI OXYDUM NIGRUM. *Dub.*

Black Oxyde of Mercury.

Take of Sublimed calomel, one part;
Water of caustic potass warmed, four parts.

Triturate them together until the oxyde become black. Wash it frequently with water, and lastly dry it upon blotting paper with a moderate heat.

THIS process is intended to furnish a protoxide of quicksilver, on which the efficacy of the mercurials most frequently employed, and most certainly useful, is supposed by some to depend.

The oxide is produced by the disposing affinity of the base, lime or potass, for muriatic acid. This is formed by the union of the chlorine of the chloride with an equivalent of hydrogen from the water, while the oxygen joins the metal to form protoxide. But it appears that this preparation, by exposure to heat or light, is partially resolved into metallic mercury, and its peroxide.

As obtained from London, and as prepared by myself, it has always had a deep olive colour; but we are told it should be of an intense black, soluble in acetic acid, and in nitric acid much diluted.

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* *Syn.* Hydrargyrum oxydulatum nigrum, Mercurius cinereus Moscati, Oxydulum hydrargyri nigrum, Protoxydum hydrargyri, Oxydulum hydrargyrosum.

Med. use.—From its liability to form peroxide, Dr Barker remarks that it is not safe for internal use.

HYDRARGYRI OXYDUM RUBRUM. *Lond.*
Red Oxyde of Quicksilver *.

Take of Purified quicksilver, by weight, one pound.

Put it into a glass vessel, with a narrow mouth and a broad bottom. Expose this vessel with its mouth open to the six-hundredth degree of heat, until the quicksilver be converted into red scales. Then grind them into a very fine powder.

Dub.

Take of Purified quicksilver, any quantity.

Put it into an open glass vessel, with a narrow mouth and wide bottom. Expose this to about the sixth-hundredth degree of heat, until the metal be converted into red scales.

THIS is an extremely tedious, and therefore expensive, operation, because mercury is incapable of absorbing from the atmosphere the quantity of oxygen necessary to convert it into the red oxide, except when in the state of vapour. But as the form of a vessel which will prevent the dissipation and loss of the mercurial vapour will, at the same time, hinder the free access and frequent renewal of the air, the operation can only proceed slowly. The vessel most advantageously employed is a wide flat-bottomed matrass, with a narrow and almost capillary neck. Only so much mercury is introduced into it as will cover the bottom of the matrass; and the vessel is not inserted in the sand deeper than the mercury stands within it. A degree of heat is then applied, sufficient to cause a gentle ebullition in the mercury, which is thus alternately converted into vapour, and condensed again in the upper part of the vessel. While in the state of vapour, it absorbs the oxygen of the air contained in the vessel, by which means it is gradually changed into a black, and then into a red powder; but a complete conversion into the latter state is not effected in less than several months.

Red oxide of quicksilver, thus prepared, consists of small crystalline scales, of a deep red colour, and very brilliant sparkling appearance. At a red heat it is decomposed, giving out oxygen gas, while the metal is revived, and is immediately volatilized. It is soluble in several of the acids, without decomposition. It is easily disoxydized. It consists of mercury 200, and oxygen 16=216.

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* *Syn.* Mercurius calcinatus, Oxydum hydrargyri per se rubrum, Oxydum hydrargyricum, Deutoxidum hydrargyri.

Med. use.—It is not only an acrid substance, violently purgative and emetic, but even caustic and poisonous. It is not used internally; but it is applied externally as an escharotic, being previously triturated to a very fine powder; or it is formed into a stimulating ointment with unctuous substances.

OXIDUM HYDRARGYRI RUBRUM per acidum nitricum. *Ed.*
Red Oxide of Quicksilver by Nitric Acid *.

Take of Purified quicksilver, three parts;
Diluted nitrous acid, four parts.

Dissolve the quicksilver, and evaporate the solution, with a gentle heat, to a dry white mass; which, after being ground into powder, is to be put into a glass cucurbit, and to have a thick glass plate laid upon its surface. Then, having adapted a capital, and placed the vessel in a sand-bath, apply a gradually increased heat, until the matter be converted into bright red scales.

HYDRARGYRI NITRICO-OXIDUM. *Lond.*
Nitric Oxide of Quicksilver.

Take of Purified quicksilver, three pounds by weight;
Nitric acid, one pound and a half by weight;
Distilled water, two pints.

Mix in a glass vessel, and boil until the quicksilver be dissolved, and after the evaporation of the water a white mass remain. Rub this to powder, and put it into another vessel, which must be very shallow; then apply a gentle heat, and gradually increase it until red vapours cease to be emitted.

HYDRARGYRI OXYDUM NITRICUM. *Dub.*
Nitric Oxide of Quicksilver.

Take of Purified quicksilver, two ounces, by weight;
Diluted nitric acid, three ounces, by measure.

Mix them in a glass vessel, and dissolve the quicksilver, with a heat greatly increased; then augment the fire until the matter remaining in the bottom of the vessel be converted into red scales.

IN the first part of these processes, a fully saturated nitrate of mercury is formed. In the second part the metal is oxidized to the maximum by the decomposition of the acid. When a sufficient heat is applied, the nitrate of mercury exhales nitrous oxide gas, and changes its colour successively to yellow, orange, and brilliant purple red. If well prepared, it should have a crystalline scaly appearance, disappear entirely at a red heat, and be soluble, without any residuum, in nitric acid.

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* *Syn.* Hydrargyri oxydatum rubrum, Mercurius praecipitatus ruber, Hydrargyrum oxydatum rubrum.

According to the annotators on the French translation, the pulverization of the nitrate of mercury ordered by the Edinburgh and London Colleges is improper, as greatly impairing the beauty of the oxide, and preventing it from having the desired crystalline aspect. Several practitioners are of opinion that this brilliancy depends upon the oxide preserving, while it loses the acid, the crystalline form of the nitrate. It is at least certain that the product is always more beautiful when the nitrate is evaporated in the same vessel in which the preparation of red precipitate is completed.

M. Paysse, who paid great attention to this preparation in Holland, where it is manufactured in large quantities, gives the following directions:—Dissolve 100 pounds of pure mercury in 140 of pure nitrous acid, of sp. gr. 1.3 to 1.37, promoting their action by a sand-bath; evaporate by distillation, and, when the formation of nitrous gas indicates the decomposition of the nitrate of mercury, remove the receiver, and apply a steady and moderate heat for about eight hours, until a match, which has been just blown out, inflames, on being introduced into the matrass, which is a proof that the operation is finished. To its success it is necessary, 1. That the nitrous acid be not mixed with muriatic; 2. That it be sufficiently strong; 3. That the evaporation be conducted with a moderate heat; 4. That the vessel be sufficiently large and flat, so that a large surface may be exposed, and the whole equally heated; 5. That the heat be gradually augmented; and, lastly, That it be steadily maintained the whole time. Turf is the fittest fuel. To this Dr Barker adds, that it be prepared in large quantity.

According to Fourcroy, it contains no nitric acid, unless a sufficient heat has not been applied; but, according to many other chemists, it contains some nitric acid, and differs from the red oxide prepared by the action of heat alone, in being always more acrid.

Med. use.—It is only used as an escharotic, and care must be taken that it is finely levigated, otherwise it only irritates, without destroying the parts to which it is applied. It is a very common application to chancres. Mixed with axunge, it also forms a very valuable stimulating ointment.

Off. Prep.—Hydrargyri cyanuretum, *D.* Unguentum hydrargyri oxydi nitrici, *D. L. E.*

HYDRARGYRI ACETAS. *Ed.*

Acetate of Quicksilver[*].

Take of Purified quicksilver, three ounces;
Diluted nitrous acid, four ounces and a half, or a little more than may be required for dissolving the mercury;
Acetate of potass, three ounces;
Boiling water, eight pounds.

Mix the quicksilver with the acid; and after the effervescence has ceased, digest, if necessary, with a gentle heat, until the quicksilver be entirely dissolved. Then dissolve the acetate of potass in the boiling water, and immediately to this solution, still hot, add the former, and mix them by agitation. Then set the mixture aside to crystallize. Place the crystals in a funnel, and wash them with cold distilled water; and, lastly, dry them with as gentle a heat as possible. In preparing the acetate of quicksilver, the whole vessels and funnels used must be of glass.

Dub.

Take of Purified quicksilver;
Acetate of potass, of each nine parts;
Dilute nitric acid, eleven parts;
Boiling distilled water, one hundred parts;
Distilled vinegar, as much as may be required.

Add the nitric acid to the mercury, and when the effervescence has ceased, digest the mixture so as to dissolve the metal. Dissolve the acetate of potass in the water, and add distilled vinegar until acid predominate in the solution. To this, boiling hot, add the solution of the quicksilver in the nitric acid, and filter the mixture quickly through double linen. Let it cool to crystallize. Wash the crystals with cold distilled water, and dry them on paper with a very gentle heat. In the whole of this process, glass vessels are to be used.

THE French Government purchased the nostrum of Keyser for the cure of syphilis, and made public the mode of preparing it. Although M. Robiquet has rendered it probable that Keyser actually manufactured the peracetate, the object of the processes of the Colleges is to prepare the protacetate. This is attempted by first preparing a solution of protonitrate of mercury, and then decomposing it by a solution of acetate of potass.

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[*] *Syn.* Hydrargyrum aceticum, Acetis hydrargyri, Protacetas hydrargyri.

In making the protonitrate of mercury, the proportion of acid used by the Colleges is different. According to the scale of equivalents, four primes of nitric acid, 216, or twice the weight diluted, 432, should be sufficient to convert three of mercury, 600, into protonitrate of mercury; but a larger quantity is necessary, for the acid rarely contains its full proportion of oxygen, and a portion of the acid is dissipated by evaporation. In the present process, the Dublin College uses eleven parts, and the Edinburgh thirteen and a half, of dilute acid, to nine of mercury. The latter proportion was ascertained to be necessary by very accurate experiment. Notwithstanding every precaution, there is always a proportion of pernitrate formed, which would deteriorate the product, on the addition to the saline solution, by the precipitation of dipernitrate, (subnitrate), if it was not kept in solution by excess of acid. In performing this process, very often considerable embarrassment arises from the quantity of water, reduced as it is by evaporation, being insufficient to keep the protonitrate formed in solution, which crystallizing over the mercury prevents it from being oxidized, although there is considerable excess of acid in the solution; and when heat is applied to dissolve the salt, pernitrate is formed. I think a larger quantity of water might be used with advantage. In the commencement of the action of the acid upon the mercury, it is to be moderated, to prevent as much as possible the formation of peroxide; but after all effervescence has ceased, a gentle heat is to be applied, so that, without the decomposition of any more acid, the peroxide, which is already formed, shall divide its oxygen with the unaltered mercury, which thus increases the quantity of protonitrate.

The Dublin College dissolves the acetate of potass in about eleven times its weight of distilled water, and also adds as much acetic acid as is sufficient to saturate the excess of alkali, which often occurs in acetate of potass. The Edinburgh College dissolves the acetate of potass in thirty-two times its weight of water. In mixing the solutions, we must be careful to pour the mercurial solution into that of the acetate of potass; because, by adopting the contrary procedure, dipernitrate of mercury is apt to be precipitated undecomposed, if any peroxide be contained in the mercurial solution. This injurious effect is also counteracted by the excess of nitric acid in the Edinburgh solution, and by the addition of acetic acid in that of Dublin. Acetate of mercury is much less soluble in cold than in hot water, and the greater part of it separates in crystals on cooling, and in a state of great purity. Lastly, the exsiccation of the acetate of mercury is an operation of great delicacy; for it is so spongy, that it retains the moisture with great obstinacy; and it is decomposed so easily, that heat can scarcely be employed to dry it. It is best dried by compressing it between several folds of bibulous paper.

In the liquid from which the protacetate of mercury has been precipitated, there remains not only all the nitrate of potass formed, but also a considerable quantity of mercury in combination with nitric acid, which a skilful operator will know how to turn to the best advantage.

In making this preparation, M. Garot, who has examined the acetates of mercury with great attention, considers the acetate of soda, which crystallizes perfectly, and of which, consequently, the composition may be known, as preferable to the acetate of potash, which, attracting the moisture from the air, does not crystallize, and is not always very equal in its composition. He also used a solution of crystallized protoacetate of mercury, by which means the inconveniences arising from the presence of pernitrate are altogether avoided. In the Parisian Pharmacopœia there is a formula for preparing the *protonitras hydrargyri:* Take of purified mercury, one part; of nitric acid, sp. gr. 1239, two parts. Dissolve by a moderate heat the greater part of the mercury in the acid, evaporate the solution, and set it aside to form white crystals.

The following process, according to M. Garot, is the best: Take of crystallized proto-nitrate of mercury, 7 parts; distilled water, 60 parts; nitric acid, 1 part; crystallized acetate of soda, 5 parts. Dissolve the proto-nitrate in the 60 parts of water, acidulated with the prescribed quantity of acid. Next dissolve the acetate of soda in the same quantity of water, and mix the two solutions.

Protacetate of mercury is insoluble in alcohol. It does not act on tournesol. Combustible vapours alter it easily. Sugar and manna have the property of decomposing it. It is precipitated black by potass, soda, and ammonia. The mode of its reaction with water deserves notice. At the ordinary temperature there is little action, and it is very sparingly soluble; one part requires 333 parts of water to dissolve it, but by the action of caloric its solubility is considerably augmented, so that by cooling a great quantity of crystals is obtained. A very singular phenomenon takes place at the same time: There remains after the action of the water a black residuum, consisting of mercury, while the mother water has become acid, and contains some deuto-acetate, from which it may be concluded, that the proto-acetate of mercury when boiled with water divides into two parts; one portion, which is the most considerable, is dissolved, and crystallizes on cooling; the other, on the contrary, is decomposed, the protoxide of mercury abandons part of its mercury, which forms the black insoluble deposit, and hence result deuto-acetate and free acid. This effect does not take place unless when the salt which has been employed is neutral. If acid has been added to the liquor, neither precipitate nor deuto-acetate is formed.

A proto-acetate of mercury may also be formed directly, by dissolving protoxide in boiling acetic acid; but this method is not used in practice. In like manner, the peracetate of mercury is formed by dissolving the peroxide in boiling acetic acid. This salt differs essentially from proto-acetate, by its physical and chemical properties. In the proto-acetate the crystalline plates are very brilliant, elastic, resisting the action of the pestle to break them, and sparingly soluble in that liquid; while, on the contrary, the crystals of the deuto-acetate are much more dull, very friable, are easily reduced to powder, of greater specific weight, very soluble in water, and exhale a very agreeable odour of acetic acid. This salt is precipitated yellow by potass and soda.

Med. use.—This salt was at one time looked upon as a mild and certain cure for the most obstinate syphilitic affections; but experience has shown that it often fails in its effect; that it produces salivation; and that it has all the inconveniences attributed to other mercurial preparations. In solution, it has also been recommended externally, to remove freckles and cutaneous eruptions; but it is little used.

HYDRARGYRI PERSULPHAS. *Dub.*
Persulphate of Mercury *.

Take of Purified mercury,
Sulphuric acid, of each six parts;
Nitric acid, one part.

Expose them to heat in a glass vessel, and increase the heat until the mass become perfectly dry.

THIS preparation is in fact a bipersulphate of mercury. It is now introduced by the Dublin College, for the first time as a distinct process, although it has long been officinal, as the first step in the preparation of subsulphate of mercury and corrosive sublimate. As the other Colleges do not use nitric acid, and its employment is not essential for obtaining the salt, but only facilitates its production, it will be better to explain, first, the operation of sulphuric acid alone. This has been examined with considerable attention by Fourcroy. In the cold they have no action on each other; but on the application of heat, the sulphuric acid begins to be decomposed, white fumes of sulphurous acid gas are extricated, and the metal is oxidized, and combines with the undecomposed acid, forming with it a white saline mass, covered with a colourless fluid. In this state it reddens vegetable blues, is acrid and corrosive, deliquesces quickly, does not become yellow by the contact of the air, and is not decomposed by water either warm or cold. It is therefore superprotosulphate of quicksilver, and the proportion of the acid in excess is variable.

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* *Syn.* Bipersulphas hydrargyri, Hydrargyrum sulphuricum.

By washing the saline mass repeatedly with small quantities of water, it is at last rendered perfectly neutral. It no longer reddens vegetable blues. It is white; it crystallizes in plates, or in fine prismatic needles; it is not very acrid; it is not decomposed either by cold or boiling water, but is soluble in 500 parts of the former, and in about 250 of the latter. It is much more soluble in water acidulated with sulphuric acid. By Dr Thomson's analysis this protosulphate consists of protoxide of mercury 208, sulphuric acid 40, and water 18=266.

But if, instead of removing the excess of acid from the supersulphate of quicksilver, by washing it with water, we continue the action of the heat according to the directions of the colleges, there is a copious evolution of sulphurous acid gas, and the saline residuum is converted into a white mass, which therefore evidently contains both a larger proportion of mercury, and in a state of greater oxidizement, than the salt from which it was formed. Dr Thomson found the composition of the bipersulphate to be, peroxide of mercury 216, sulphuric acid 9, and water 80=305.

Mr Brande says, that at Apothecaries Hall, 50 lbs. of mercury with 70 of sulphuric acid yield 73 lbs. of persulphate of mercury. In the formula of the Dublin College a proportion of nitric acid is added, which is said by Dr Barker to facilitate the oxidation of the mercury, so that it is completed in a much shorter time, to produce a whiter salt, and to lessen the quantity of sulphuric acid required. The nitric acid is entirely decomposed, and gives rise to the emission of red fumes in the commencement of the process.

Off. Prep.—Hydrargyri oxydum sulphuricum, *D.* Hydrarg. murias corrosivum, *D.* Calomelas sublimatum, *D.*

SUBSULPHAS HYDRARGYRI FLAVUS. *Ed.*

Yellow Subsulphate of Quicksilver *.

Take of Purified quicksilver, two parts;
Sulphuric acid, three parts.

Put them into a glass cucurbit, and boil them in a sand-bath to dryness. Reduce to powder the white matter which is left in the bottom, and throw it into boiling water. A yellow powder will immediately be produced, which must be frequently washed with warm water.

HYDRARGYRI OXYDUM SULPHURICUM. *Dub.*

Sulphuric Oxyde of Quicksilver.

Take of Persulphate of mercury, one part;
Warm water, twenty parts.

Triturate them together in an earthen mortar, and pour off the supernatant liquor. Wash the yellow powder with warm distilled water, as long as the addition of a few drops of water of caustic potass causes any precipitate. Lastly, dry the sulphuric oxyde of mercury.

ACCORDING to Dr Barker the water acts in this process merely by abstracting one of the two equivalents of acid existing in the bipersulphate of mercury, so that it is reduced to the state of a persulphate, consisting of one equivalent of peroxide 216, and one of sulphuric acid 40=256. This does not differ very much from the analyses of the best chemists. For each equivalent of mercury Braamcamp and Siqueira Oliva found 38 of acid, the editors of the *Dict. des Drogues* 34.7, and Fourcroy 26.3. But the decomposition is probably less simple than what is stated; for the liquid from which the turpeth mineral is precipitated certainly contains mercury, as is proved by its being precipitated by *aqua potassæ;* and the editors of the *Dict.* tell us, that by evaporation it furnishes an acid mercurial salt, in small crystals, of a fine orange yellow colour, which by continuing the heat furnishes with water an additional quantity of turpeth.

Turpeth mineral has a bright yellow colour, a considerably acrid taste, is soluble in 2000 parts of cold water, is also soluble in sulphuric acid slightly diluted, is decomposed by the nitric acid, and forms muriate of quicksilver with muriatic acid, while the neutral sulphate forms submuriate. It oxidizes quicksilver, and is converted by trituration with it into black powder. At a red heat it gives out oxygen gas, and the metal is revived.

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* *Syn.* Oxydum hydrargyri sulphuricum, Subsulphas hydrargyri peroxydati, Subdeutosulphas hydrargyri, Turpethum minerale.

Med. use.—It is a violent emetic. Its action, however, is not always confined to the primæ viæ; it sometimes excites salivation, if a purgative be not taken soon after it. It was formerly used in virulent gonorrhœa; but its chief use, at present, is in swelled testicle; and it seems to perform the office of a discutient, by the nausea and severe vomiting it excites. It is said likewise to have been employed, with success, in robust constitutions, against leprous disorders, and obstinate glandular obstructions. The dose as an emetic is from two grains to six or eight. A grain or two may be given as an alterative and diaphoretic. Dr Hope senior found, that one grain, with a little powder of liquorice root, formed a very convenient and powerful errhine. It has also been recommended as the most effectual preservative against hydrophobia. On the whole, however, it is a superfluous preparation, whose place may be more safely supplied by other mercurials or emetics.

MURIAS HYDRARGYRI CORROSIVUS. *Ed.*

Corrosive Muriate of Quicksilver *.

Take of Purified quicksilver, two pounds;
Sulphuric acid, two pounds and a half;
Dried muriate of soda, four pounds.

Boil the quicksilver with the sulphuric acid in a glass vessel, placed in a sand-bath, until a dry mass remain, which when cold is to be mixed in a glass vessel, with the muriate of soda; then sublime in a glass cucurbit, with a heat gradually increased. Lastly, separate the sublimed matter from the scoriæ.

HYDRARGYRI OXYMURIAS. *Lond.*

Oxymuriate of Quicksilver.

Take of Purified quicksilver, two pounds;
Sulphuric acid by weight, thirty ounces;
Dried muriate of soda, four pounds.

Boil the quicksilver with the sulphuric acid, in a glass vessel, until the sulphate of quicksilver be reduced to dryness; triturate this after it has cooled, in an earthen mortar, with the muriate of soda; then sublime it from a glass cucurbit, with a gradually increased heat.

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* *Syn.* Hydrargyrum muriaticum corrosivum, Murias hydrarg. acerrimum, Mercurius sublimatus corrosiv. Murias hydrarg. oxygenatus, Deutomurias hydrarg. Murias hydrargiricus corrosivus, Hydrarg. oxydatum muriaticum, Bichloridum hydrargyri.

HYDRARGYRI MURIAS CORROSIVUM. *Dub.*
Corrosive Muriate of Mercury.

Take of Persulphate of mercury, five parts;
Dried muriate of soda, two parts.

Triturate them well together in an earthenware mortar into a very fine powder. Then sublime from a fit vessel into a receiver, with a gradually increased heat, the corrosive muriate of mercury.

THIS salt consists, according to Mr Zaboada, following the old doctrine, of 71.5 quicksilver, combined with 8.5 of oxygen, and 20 muriatic acid. But it is now denominated by chemists the Bichloride of mercury, and consists of two equivalents of chlorine 72, and one of mercury 200 = 272. It is formed by the mutual decomposition of the bipersulphate of mercury, and the chloride of sodium. Two equivalents of the chloride are decomposed by one of the bipersulphate. The two atoms of sodium are converted into soda, which unites with the two atoms of sulphuric acid, while the one atom of mercury unites with the two atoms of chlorine to form the bichloride. According to the atomic scale, 297 of bipersulphate should be decomposed by 120 of chloride of sodium, and the product should be 272 of bichloride of mercury; and Dr Barker ascertained by careful experiment, that in these proportions they produce complete reciprocal decomposition, as the residuum of the sublimation was entirely soluble in water, and contained no mercury. The London and Edinburgh Colleges, therefore, order much more sea salt than is necessary. Some excess is probably useful to ensure perfect decomposition. At Apothecaries Hall, 73 lbs. of bipersulphate are used with 120 lbs. of common salt, and yield from 63 to 65 lbs. of corrosive sublimate. In Holland, corrosive sublimate is manufactured by subjecting to sublimation a mixture of dried sulphate of iron, nitrate of potass, muriate of soda, and quicksilver.

Corrosive sublimate crystallizes by sublimation, in prismatic needles, forming a white semi-transparent ponderous mass. Its taste is acrid, styptic, and durable. It is soluble in 20 parts of cold water, and in 2 at 212°. A warm and saturated solution of bichloride of mercury crystallizes by cooling into a confused mass, whilst a solution which contains only an eighth or tenth part of its weight of the salt crystallizes, according to M. Guibourt, in fine white and satiny needles. It is also soluble in 3.8 parts of alcohol, at 70°, and in almost an equal weight of boiling alcohol. It gives a green colour to syrup of violets. It is not altered by exposure to the air, and is sublimed unchanged by heat. It is not decomposed by any of the acids, but is soluble, without alteration, in the sulphuric, nitric, and muriatic acids. It is precipitated by all the alkalies and earths, of an orange-yellow colour, which gradually changes to a brick-red; and, by their carbonates, of a permanent yellow colour. Ammonia forms with it an insoluble, white, triple salt. It is also decomposed by several of the metals. Corrosive sublimate is converted into calomel by kermes mineral.

Med. use.—Corrosive sublimate is one of the most violent poisons with which we are acquainted. Externally, it acts as an escharotic or a caustic; and in solution it is used for destroying fungous flesh, and for removing herpetic eruptions; but even externally it must be used with very great caution. It has, however, been recommended to be given internally by the respectable authorities of Boerhaave and Van Swieten; and it is the active ingredient of most empirical antivenereal syrups. Were it really capable of curing the venereal disease, or equal in efficacy to the common modes of administering mercury, it would possess many advantages over them in other respects; but that it cannot be depended upon, is almost demonstrated by its use, as an antivenereal, being very much confined in this country to the empirics, and by the testimony of the most experienced practitioners. Mr Pearson says, that it will sometimes cure the primary symptoms of syphilis, especially if it produce considerable soreness of the gums, and the common effects of mercury; but that it will often fail in removing chancre, and where it has removed it, that the most steady perseverance will not secure the patient from a constitutional affection. According to M. Barbier, Dr Cullerier is always successful with corrosive sublimate. It is, on many occasions, at least a useful auxiliary to a mercurial course, by quickly bringing the system under the influence of mercury, and by supporting its action after the use of frictions; and it is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the desquamation of eruptions.

This salt may be used with great advantage for the preservation of animal matters, which, from immersion in a solution of it in water, acquire the hardness of wood, and become imputrescible.

M. Orfila has recommended albumen in cases of poisoning by sublimate. For this purpose whites of eggs may be diffused in cold water, (the yolks may also be kept,) in the proportion of one dozen of eggs to two pounds of water, and a glassful of it administered every ten minutes. M. Taddei recommends wheat flour and its gluten. This chemist found that animals may take large doses of sublimate mixed with these substances, because it is converted by them into calomel.

Off. Prep.—Liquor hydrargyri oxymuriatis, *L.*

LIQUOR HYDRARGYRI OXYMURIATIS. *Lond.*
Solution of Oxymuriate of Quicksilver *.

Take of Oxymuriate of quicksilver, eight grains;
Distilled water, fifteen fluidounces;
Rectified spirit, one fluidounce.

Dissolve the oxymuriate of quicksilver in the distilled water, and add to it the spirit.

THIS solution contains in each fluidounce half a grain of the bichloride of quicksilver. But, in the act of solution, it is converted into the permuriate; two equivalents of water are decomposed, each of the two equivalents of chlorine, of which it consists, uniting with two of hydrogen, to form two of muriatic acid, and the single equivalent of mercury with the two of oxygen, to form one of peroxide of mercury. Common water will not do for this solution, as it decomposes the mercurial salt. The spirit is added to preserve the solution from spoiling.

SUBMURIAS HYDRARGYRI MITIS, sive CALOMELAS. *Ed.*
Mild Submuriate of Quicksilver, or *Calomel* †.

Take of Muriate of quicksilver, four parts;
Purified quicksilver, three parts.

Triturate finely in a glass mortar the muriate with a little water, to prevent the acrid powder from rising, then add the quicksilver, and triturate again until the mercury be extinguished; and having put the powder, after being dried, into an oblong phial, of which it fills only one-third, sublime from warm sand. Reduce the sublimate to powder, and sublime it a second time. Grind this sublimate into a very minute powder, which is, lastly, to be washed with boiling distilled water.

CALOMELAS SUBLIMATUM. *Dub.*
Sublimed Calomel.

Take of Persulphate of mercury, twenty-five parts;

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* *Syn.* Aqua phagedenica, Liquor muriatis hydrargyri, Solutio muriatis hydrargyri oxygenati, Solutio bipermuriatis hydrargyri.

† *Syn.* Hydrargyrum muriaticum mite, Murias hydrargyri mitis, Murias hydrarg. oxydulati, Mercurius dulcis, Mercurius hydrargyri dulcis, Protochloruretum hydrargyri, Murias hydrargyricum, Hydrarg. oxydulatum muriaticum, Chloridum hydrargyri.

Purified quicksilver, seventeen parts;
Dried muriate of soda, ten parts.

Triturate the persulphate of mercury and the purified quicksilver together in an earthen mortar, until the metallic globules cease to be visible. Then add the dried muriate of soda, mix them well, and sublime from a proper vessel into a receiver, by a gradually increased heat. Reduce the sublimate to powder, and wash it with water, as long as the addition of a few drops of water of caustic potass causes any precipitate. Lastly, dry the Calomel.

HYDRARGYRI SUBMURIAS. *Lond.*
Submuriate of Quicksilver.

Take of Purified quicksilver, four pounds;
Sulphuric acid, by weight, thirty ounces;
Muriate of soda, one pound and a half;
Muriate of ammonia, eight ounces.

Boil two pounds of the quicksilver with the sulphuric acid in a glass vessel, until the sulphate of quicksilver be rendered dry. Rub this, when it has become cool, with the other two pounds of quicksilver in an earthen mortar, until they be intimately mixed. Then add the muriate of soda, and rub them together until the globules entirely disappear; then sublime. Triturate the sublimate into a very subtile powder, pass it through a sieve, and wash it with the muriate of ammonia previously dissolved in a gallon of distilled water, set aside until the powder subside; decant off the liquor, and wash the powder with boiling distilled water repeatedly until it give no precipitate, on the addition of the solution of ammonia. Lastly, reduce it to a very fine powder, in the manner directed for the preparation of chalk.

In the first part of this process, the additional mercury is merely mechanically divided by the bichloride of mercury, as a dry powder, and by the sublimation the bichloride yields one-half of its chlorine to the mercury, so that the bichloride is converted into chloride.

The trituration of the muriate of mercury is a very noxious operation, as it is almost impossible to prevent the finer particles from rising and affecting the operator's eyes and nostrils. To lessen this evil, the Edinburgh College directs the addition of a little water. In the second part of the process, when the heat is applied, a small portion of quicksilver and undecomposed bichloride first arise, and condense themselves in the highest part or neck of the phial; then the calomel rises, and, being less volatile, condenses in the upper half of the body, while a small quantity of quicksilver, in a state of considerable oxidizement, remains fixed, or near the bottom. A second sublimation is therefore necessary, especially if we triturate the whole products of the first sublimation together: but any farther repetition of the process is perfectly useless.

In the processes of the London and Dublin Colleges, a persulphate of mercury is first formed, with which the additional equivalent of mercury is triturated until its globules cease to be visible. By sublimation with the chloride of sodium, the oxygen of the bipersulphate unites with two of sodium to form two of soda, which, with the two of sulphuric acid, form two of sulphate of soda, while the two of chlorine disengaged unite with the equivalent of mercury in the bipersulphate, and with the additional equivalent, mechanically mixed, to form chloride of mercury. Lest any portion of bichloride should have escaped decomposition, the calomel must be edulcorated until the water which comes off forms no precipitate with alkalies. The Dublin College uses for this purpose cold water, the Edinburgh boiling water, and the London at first a weak solution of muriate of ammonia, and afterwards boiling distilled water. But the solution of muriate of ammonia must be used cold; for if boiling it decomposes calomel, and converts it into corrosive sublimate and metallic quicksilver.

Sublimed calomel is generally obtained in the form of a white solid mass, but is capable of crystallizing in tetrahedral prisms terminated by pyramids. It has no taste, and is scarcely soluble in water or in alcohol. It is less volatile than the bichloride. It is blackened by light, and becomes brown or black when triturated with lime water or the alkalies. It is converted by chlorine into bichloride.

Corrosive sublimate consists of one equivalent of mercury 200, and two of chlorine 72=272, and the calomel of one of mercury 200, and one of chlorine 36=236; which gives us 73.53 as the quantity of mercury necessary to convert 100 of bichloride into chloride.

A very ingenious method of condensing the sublimed calomel in a state of minute division, and necessarily free from any admixture of corrosive sublimate, invented by Mr Jewell, has been adopted into the French Pharmacopœia *. It

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* "Take of calomel any quantity; put it into a porcelain retort entirely luted; let the neck be inserted into a glazed earthenware or porcelain receiver filled with water. Heat both vessels by applying fire under them; the retort to such a degree that the salt may sublime, and the receiver so that the water may boil. The vapours of the calomel and water being thus mutually mixed, the

consists in causing the calomel in vapour to come in contact with steam, and to be condensed in an impalpable powder in water. It has got the name of Howard's or Jewell's Hydrosublimate of mercury.

Med. use.—The submuriate of quicksilver is one of the best mercurials we possess. By proper management it may be made to increase, in a remarkable manner, almost any of the secretions or excretions. One grain mixed with sugar, and snuffed up the nostrils, is recommended as a powerful errhine in amaurosis. The same mixture is blown into the eye, to remove specks from the cornea. Given in doses of one grain morning and evening, or in large doses combined with opium, to prevent it from acting as a purgative, it excites ptyalism. In larger doses of five grains and upwards, it is an excellent purgative. Combined with diuretics, it proves diuretic, and with sudorifics, sudorific.

It is one of the preparations of mercury which is capable of curing syphilis in every form. It also produces very powerful and salutary effects in obstructions and chronic inflammations of the viscera, especially of the liver; and, in general, it is applicable to every case in which mercurials are indicated.

Off. Prep.—Hydrargyri oxydum nigrum, *D.* Pilulæ calomelanos comp. *D.*

SUBMURIAS HYDRARGYRI PRÆCIPITATUS. *Ed.*
Precipitated Submuriate of Quicksilver *.

Take of Diluted nitrous acid,

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mercurial salt will be deposited in the water in the form of a very white and extremely subtile powder, which is to be dried in the shade, and preserved for use."

M. Henry has modified the apparatus employed. Instead of using calomel previously prepared, it is made by the same operation in which it is condensed by vapour. He uses two retorts, the necks of which are inserted into the opposite orifices of a three-necked balloon, while a lateral spout is inserted into a two-necked bottle half filled with distilled water, and furnished with a tube of safety. The one retort is merely for the production of steam for condensing the calomel. The other retort must have a very short and wide neck, and be capable of standing the heat of a reverberatory furnace, in which it is placed; and into this retort M. Henry introduces a mixture of six parts of deuto-sulphate of mercury, four parts of mercury, and three parts of sea-salt, as the mercurial vapour is more slowly generated, and less apt to obstruct the neck of the retort than when calomel is used. Soon after the application of the heat white vapours appear in the balloon, condense on its sides like snow, and are washed down into the bottle below. When the vapours cease to appear, the apparatus is allowed to cool, the white powder is collected upon a filter and washed, until the water employed cease to indicate the presence of corrosive sublimate. The powder is then to be carefully dried, and should be passed through a very fine sieve, to separate some particles of calomel not sufficiently fine.

* *Syn.* Mercurius dulcis præcip. Protochloruretum hydrarg. præcip. Chloridum hydrarg. præcip.

Purified quicksilver, of each eight ounces;
Muriate of soda, four ounces and a half;
Boiling water, eight pounds.

Mix the quicksilver with the acid, and, towards the end of the effervescence, digest with a gentle heat, frequently shaking the vessel in the meantime. But it is necessary to have added more quicksilver to the acid than it is capable of dissolving, that a perfectly saturated solution may be obtained. Dissolve at the same time the muriate of soda in the boiling water, and into this solution pour the other while still hot, and mix them quickly by agitation; pour off the saline liquor after the precipitate has subsided, and wash the submuriate of quicksilver by repeated affusions of boiling water, which is to be poured off each time after the deposition of the submuriate, until the water comes off tasteless.

CALOMELAS PRÆCIPITATUM. *Dub.*
Precipitated Calomel.

Take of Purified quicksilver, seventeen parts;
Dilute nitrous acid, fifteen parts.

Pour the acid upon the quicksilver in a glass vessel; and when the mixture has ceased to effervesce, digest in a moderate heat, with occasional agitation, for six hours. Then increase the heat, until the liquor boil a little, which is to be poured off from the quicksilver which remains, and quickly mixed with a solution already prepared, of Muriate of soda, seven parts, in four hundred parts of boiling water. Wash the powder which subsides, with warm distilled water, as long as the liquor decanted from it is precipitated by some drops of water of caustic potass; then dry it.

In the first part of this process, a saturated solution of proto-nitrate of quicksilver is attempted to be formed; and the proportions used are such that a small quantity of mercury remains undissolved. In the second, there is a mutual decomposition of this nitrate, and of the muriate of soda; nitrate of soda is formed, and calomel; or, according to Sir H. Davy, the chloride of sodium on being dissolved is converted into muriate of soda by decomposing water; and on being mixed with the solution of nitrate of mercury, the chlorine and mercury are precipitated in the state of insoluble chloride, while their hydrogen and oxygen unite to form water, and the soda combines with the nitric acid.

Although, in the first part of this process, the object is the same as in that for acetate of mercury, different proportions of mercury and acid are used. For preparing the acetate, the quantity of dilute nitric acid was greater than that of the mercury. In the present process, the Edinburgh College uses equal weights, and the Dublin 17 of mercury to 15 of acid. This excess of mercury is ordered to secure the complete saturation of the acid; and with the same view the six hours' digestion is ordered, of which I greatly doubt the propriety, not only on account of the embarrassment arising from the crystallization of the salt, but also, as Dr Murray observed, more of mild, and less of corrosive muriate of mercury are formed, when the solution is made slowly in the cold, than when the directions of the colleges are complied with. Mr Phillips found, that even when more mercury is used than the acid can dissolve, a large portion of peroxide of mercury is formed, which can be thrown down by an alkali, after the precipitation of the calomel. 48 parts of mercury gave 15 of peroxide, after the calomel had been separated.

When the solution of mercury is added to the solution of sea salt, the whole of the peroxide is precipitated in the form of calomel, and the peroxide remains in solution, as corrosive sublimate, mixed with nitrate of soda. This portion will, however, be easily made use of by an ingenious pharmaceutist, and a process, with this view, is given by the Dublin College. To remove any adhering corrosive sublimate, the directions of the Colleges for washing the calomel must be strictly followed.

When properly prepared, the submuriate obtained by precipitation scarcely differs from that obtained by sublimation. Göttling found no other difference than that the precipitated submuriate becomes grey, when triturated with lime-water, whereas the sublimed submuriate becomes black. But he exposed to heat half an ounce of the precipitated submuriate in a subliming apparatus; scarcely a grain of a reddish matter remaining fixed; and the sublimed matter now became black when triturated with lime water, and differed in no respect from submuriate prepared in the ordinary way by sublimation. It therefore would seem to be an improvement in the process, to sublime the submuriate after it is precipitated, especially as by that operation it would be most effectually separated from any subnitrate which might be mixed with it.

Med. use.—The same as that of sublimed calomel, although by some it is supposed to be more purgative.

HYDRARGYRI SUBMURIAS AMMONIATUM. *Dub.*
Ammoniated Submuriate of Quicksilver [*].

Add to the liquor decanted from the precipitated calomel, as much water of caustic ammonia as is sufficient to precipitate the whole metallic salt. Wash the precipitate with cold distilled water, and dry it on blotting paper.

THIS process of the Dublin College has the merit of being economical, as it turns to good account the residuum of another process. The solution from which calomel has been precipitated retains some muriate of mercury in solution. On the addition of ammonia, a triple salt, the submuriate of mercury and ammonia, is formed, which is a white insoluble powder.

HYDRARGYRUM PRÆCIPITATUM ALBUM. *Lond.*
White Precipitated Quicksilver.

Take of Oxymuriate of quicksilver, half a pound;
Muriate of ammonia, four ounces;
Solution of subcarbonate of potass, half a pint;
Distilled water, four pints.

Dissolve first the muriate of ammonia, and afterwards the oxymuriate of quicksilver, in the distilled water, and add to these the solution of subcarbonate of potass. Wash the precipitate until it become insipid, and then dry it.

BICHLORIDE of quicksilver is about thirty times more soluble in a solution of muriate of ammonia than in pure water; and, during the solution, there takes place a considerable increase of temperature. This compound may be termed Muriate of mercury and ammonia. It is the *Sal Alembroth* of the alchemists. It is very soluble in water, and is sublimed by heat without decomposition. When to a solution of this salt we add a solution of an alkaline carbonate, there occurs a partial decomposition. The alkali combines with a portion of the muriatic acid, and reduces the muriate of mercury and ammonia to the state of a submuriate, which being insoluble, falls to the bottom of the solution. The proportion of muriate of ammonia employed was reduced in edition 1815 to one-half, probably in consequence of a remark of Mr Phillips.

The submuriate of mercury and ammonia has at first an earthy, and afterwards a metallic taste. It is not soluble in water. It is decomposed by heat, furnishing water, ammonia, and nitrogen gas, while 86 *per cent.* of submuriate of mercury remain behind. Sulphuric and nitric acids partially decompose it, and convert it into muriate of mercury, and triple salts of mercury and ammonia. Muriatic acid dissolves it, and converts it into muriate of quicksilver and ammonia. According to Fourcroy's analysis, it consists of 81 oxide of mercury, 16 muriatic acid, 3 ammonia = 100.

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[*] *Syn.* Hydrargyrum ammonio-muriaticum, Murias hydrargyro-ammoniacalis insolubilis, Mercurius præcipitatus albus, Submurias ammonio-hydrargyricum, Murias hydrarg. oxygenati et ammoniati, Deutochloruretum hydrargyri et hydrochloras ammoniæ, Chloridum hydrargyri et ammoniæ.

Pharm. use.—It is only used for ointments; and its principal recommendation is its white colour.

HYDRARGYRI CYANURETUM. *Dub.*
Cyanuret of Mercury.

Take of Cyanuret of iron, six parts;
Nitric oxyde of mercury, five parts;
Distilled water, forty parts.

Mix the cyanuret of iron and the oxyde of mercury, then add them to the boiling water. Boil the mixture for half an hour with constant agitation, and filter through bibulous paper. Wash the residuum often with hot distilled water. Lastly, filter the liquors, and evaporate them until they furnish crystals by refrigeration.

PRUSSIAN blue, called by the Dublin College Cyanuret of iron, is now generally considered to be the ferrocyanate of iron, consisting of two equivalents of peroxide of iron 80, as the base, united with one of metallic iron 28, two of hydrogen 2, and three of cyanogen 78 = 108 ferrocyanic acid, and in all 188 ferroprussiate of iron. By boiling this with peroxide of mercury mutual decomposition takes place, two equivalents of the cyanogen 52, unite with the mercury 200, to form cyanuret, or rather bicyanide of mercury 252, which remains in solution along with two of water 18, while one equivalent of cyanide of iron 54, and two of peroxide of iron 80, are precipitated insoluble, = 134.

Prussian blue, as it occurs in commerce, is rarely sufficiently pure for this process, from its containing alumine; but it may be purified by digesting it with muriatic acid diluted with ten times its bulk of water. When Prussian blue is mixed with the red oxide of mercury and water, the colour of the mixture is deep blue, but, as the decomposition takes place on boiling the mixture, the blue colour disappears, and the red colour of peroxide of iron prevails. This serves as a means of knowing when a sufficient quantity of peroxide of mercury has been employed, which should be continued to be added until the blue colour has disappeared. The solution is separated from the precipitate by filtration, and the crystals are easily obtained by due evaporation and cooling.

Bicyanide of mercury is white, crystallizes in four-sided prisms obliquely truncated, permanent in the air, is very soluble in water, is not decomposed by the caustic fixed alkalies, but is decomposed by sulphuretted hydrogen, and the hydrosulphurets.

Off. Prep.—Acidum prussicum, *D.*

HYDRARGYRI SULPHURETUM NIGRUM. *Lond.*
Black Sulphuret of Quicksilver *.

Take of Purified quicksilver, one pound, by weight;
Sublimed sulphur, one pound.
Triturate them together until the globules disappear.

Ed.

Take of Purified quicksilver,
Sublimed sulphur, each equal weights.
Grind them together in a glass mortar, with a glass pestle, till the mercurial globules totally disappear,

It is also prepared with twice the quantity of quicksilver.

Dub.

Take of Purified quicksilver,
Sublimed sulphur, of each one part.
Triturate them together into a stoneware mortar until the globules disappear.

It was formerly imagined, that the quicksilver was merely mechanically divided, and intimately mixed with the sulphur. But that they are really chemically united is proved by the insolubility of the compound in nitrous acid. The chemical constitution of this compound, *Æthiops mineral*, is disputed. It is, however, considered no longer as a combination of the protoxide of mercury, but of metallic mercury with sulphur. It is supposed by many to be a proto-sulphuret, and among these by Dr Barker, who represents pure protosulphuret as consisting of one equivalent of sulphur, 16, and one of mercury, 200=216. Even according to this view, there is a very great excess of sulphur, amounting to 184 in 400 of the officinal preparation. M. Guibourt, however, is of opinion that there is no proto-sulphuret, but only a bisulphuret of mercury, and that what has been considered as a proto-sulphuret is only a mixture of bisulphuret with mercury, as it yields quicksilver by mere compression. The bisulphuret of mercury has not always the red colour of vermilion; for when the salts containing the peroxide of mercury are decomposed by sulphuretted hydrogen in excess, a fine black precipitate is obtained, from which no mercury can be separated by compression, and which by sublimation is entirely converted into cinnabar, without the separation of sulphur or mercury, whereas the æthiops mineral yields cinnabar and mercury. But it is difficult to conceive the existence of both mercury and sulphur along with bisulphuret of mercury. According to this view, officinal æthiops mineral consists of bisulphuret of mercury, 232, uncombined mercury, 200, and uncombined sulphur, 368=800. The presence of metallic mercury is also inconsistent with its not being acted upon by nitric acid, and with its want of action as a medicine.

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* *Syn.* Hydrargyrum sulphuratum nigrum, Æthiops mineralis.

The officinal black sulphuret of quicksilver, prepared by trituration, has a pulverulent form, is insoluble in nitric acid, is totally soluble in solution of potass, and is precipitated unchanged from this solution by acids. It is not altered by exposure to the air. When heated in an open vessel, it emits sulphurous acid gas, acquires a dark violet colour, and, lastly, sublimes in a brilliant red mass, composed of crystalline needles.

The combination of quicksilver with sulphur may be much more speedily effected by the assistance of heat, by pouring the mercury, previously heated, upon the sulphur in a state of fusion, and stirring them until they cool and form a consistent mass, which may be afterwards powdered. The sulphuret prepared by fusion differs, however, from that prepared by trituration; for it is not soluble in a solution of potass, but is converted by long ebullition in it into the red sulphuret, and it also reddens spontaneously, in course of time, from the action of the air. Dr Barker says it cannot be used internally, as the sulphur is partly acidified, and that it has some of the violent effects of sulphate of mercury.

Black sulphuret of mercury may be also prepared in the humid way, as it is called, by precipitating any of the mercurial salts by sulphuretted hydrogen or a hydrosulphuret. According to Berthollet, mercury agitated with hydrosulphuret of ammonia forms a black sulphuret exactly resembling that prepared by trituration.

Med. use.—As a medicine, black sulphuret of quicksilver possesses no evident effects. It is principally used as an alterative in glandular affections, and in cutaneous diseases. It has been commonly given in doses of from 5 to 10 grains; but even in doses of several drachms, and continued for a considerable length of time, it has scarcely produced any sensible effect.

SULPHURETUM HYDRARGYRI RUBRUM. *Dub.*
Red Sulphuret of Quicksilver *.

Take of Purified quicksilver, twenty-one parts;
Sublimed sulphur, three parts.

Mix the quicksilver with the melted sulphur; and if the mixture take fire, extinguish it by covering the vessel; afterwards reduce the mass to powder, and sublime it.

Lond.

Take of Purified quicksilver, by weight, forty ounces;
Sublimed sulphur, eight ounces.

Mix the quicksilver over the fire with the melted sulphur; and as soon as the mass swells up, remove the vessel from the fire, and cover it strongly, to prevent it from catching fire; then powder it and sublime.

In this process each equivalent of mercury, 200, is combined with two equivalents of sulphur, 32, and form the bisulphuret, 232, formerly called Cinnabar. Mercury and sulphur on being heated unite with great energy. Dr Barker directs that the sulphur should be first melted, and the mercury made to fall into it in a shower, by straining it through linen or leather. On continuing the heat, at first a small portion of sulphur is volatilized; and on increasing the temperature, union takes place suddenly, and with a slight explosion the sulphur takes fire, and must be extinguished. By increasing the heat almost to redness the bisulphuret of mercury is sublimed, but rises very little before it is again condensed.

MM. Tuckert and Paysse have described, from actual observation, the process followed in the manufactory of M. Brand at Amsterdam, where 48,000 pounds of cinnabar were annually prepared. 150 pounds of sulphur are mixed with 1080 pounds of mercury, and exposed to a moderate heat in a bright iron kettle, one foot deep, and two and a half in diameter. The black sulphuret of mercury, thus produced, is reduced to powder, and put up in earthen pots capable of containing about a quart of water. The subliming apparatus consists of three large coated crucibles, bound with iron, and surmounted with domes of iron, through the top of which the black sulphuret is introduced. These are built into a furnace, in such a manner that two-thirds of each apparatus is exposed to the action of the flame, which circulates freely around them. The fuel made use of is turf, which is found preferable to all others. The fire is kindled in the evening; and when the crucibles have become red, the pots containing the black sulphuret are emptied successively into them, at first one into each, and afterwards two, three or more, at a time, according to the violence of the inflammation which succeeds. Sometimes the flame rises four, or even six feet above the domes; when its violence is a little abated, the aperture is covered closely up with a lid of iron. In this manner the whole quantity is introduced into the three crucibles in about thirty-four hours. The fire is steadily supported for thirty-six hours, and the sublimation assisted by stirring the matter every quarter of an hour with a triangle of iron, until the whole is sublimed, when the fire is allowed to expire. The colour of the flame changes during the process from a dazzling white to a yellow-white, orange-yellow, blue and yellow, green, violet, and blue and green. When it acquires a fine sky-blue, or indigo colour, and rises only an inch or two above the aperture, the aperture is closed hermetically, and luted with clay and sand. After the apparatus has cooled, 400 pounds of sublimed red sulphuret of mercury are found in each, so that there is a loss of 30 pounds on the 1230 of materials employed.

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* *Syn.* Cinnabaris, Bisulphuretum hydrargyri, Hydrargyri sulphuratum rubrum.

The process by which cinnabar is converted into vermilion is kept a secret by the Dutch; but M. Paysse discovered, that by keeping some levigated cinnabar in the dark, covered with water, and stirred frequently for a month, it acquires the brilliant colour of Chinese vermilion.

When taken out of the subliming vessels, the red sulphuret of quicksilver is a heavy brilliant crystalline mass, and first acquires its very rich colour when reduced to the form of a fine powder by trituration. It has neither smell nor taste, and is insoluble in water and in alcohol. In close vessels it sublimes entirely unchanged, but requires for this purpose a considerable degree of heat. It is not soluble in any acid, and is decomposed by the nitro-muriatic only, which dissolves the quicksilver, and separates the sulphur. It is decomposed by melting it with potass, soda, lime, iron, lead, copper, antimony, and several other metals, but not by boiling it with solutions of the alkalies.

Med. use.—Red sulphuret of quicksilver is sometimes used in fumigation against venereal ulcers in the nose, mouth, and throat. By inhaling the fumes produced by throwing half a drachm of it on red-hot iron, a violent salivation has been produced. This effect is by no means owing to the medicine as a sulphuret; for by the mode in which the heat is applied, it is decomposed. The mercury is resolved into vapour, and blended with the sulphurous acid gas; in which circumstances, this mineral has very powerful effects.

Mr Pearson, from his experiments on mercurial fumigation, concludes, that where checking the progress of the disease suddenly is an object of great moment, and where the body is covered with ulcers, or large and numerous eruptions, and, in general, to ulcers, fungi, and excrescences, the vapour of mercury is an application of great efficacy and utility; but that it is apt to induce ptyalism rapidly, and great consequent debility; and that, for the purpose of securing the constitution against a relapse, as great a quantity of mercury must be introduced into the system by inunction as if no fumigation had been employed.

CHAP. XII.—LEAD.

PLUMBI ACETAS. *Lond.*

Acetate of Lead *.

Take of Subcarbonate of lead, one pound;
Stronger acetic acid, one pint;
Boiling distilled water, a pint and a half.

Mix the acid with the water; gradually add to the mixture the subcarbonate of lead, and boil until the acid be saturated; then filter through paper; and after evaporation till a pellicle be formed, set it aside to crystallize. Pour off the liquid, and dry the crystals on blotting paper.

Dub.

Take of Carbonate of lead, called *Ceruse*, any quantity;
Distilled vinegar, ten times its weight.

Digest in a glass vessel, until the vinegar become sweet. Having poured this off, add more vinegar, until it cease to become sweet. Filter the liquor, and crystallize by alternate slow evaporation and refrigeration. The crystals are to be dried in the shade.

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* *Syn.* Plumbum aceticum, Acetas plumbi acidulus siccus, Acetis plumbi, Saccharum saturni, Plumbi superacetas, Acetas plumbi in crystallos concretus, Acetas plumbi crystallizatus.

ACETAS PLUMBI, olim SACCHARUM SATURNI. *Ed.*
Acetate of Lead, formerly *Sugar of Lead.*

Take of White oxide of lead, any quantity;
Distilled acetic acid, a sufficient quantity.

Pour upon the oxide, put into a cucurbit, ten times its weight of acid.

Let the mixture stand upon warm sand till the acid becomes sweet, which is then to be poured off, and fresh acid added until it cease to become sweet; then evaporate all the liquor, defæcated, in a glass vessel, to the consistence of thin honey, and set it aside in a cold place, that crystals may be formed, which are to be dried in the shade. The remaining liquor is again to be evaporated, that new crystals may be formed; and the evaporation is to be repeated until no more crystals concrete.

THE acetate of lead is never prepared by the apothecary, as he can procure it in great perfection at a much cheaper rate from those who manufacture it in large quantities. The preparation of it, as directed by the colleges, is a case of simple dissolution. The process frequently fails, from the white lead employed being adulterated with chalk or some other earthy substance; and Mr Phillips says that litharge is commonly employed by the manufacturers of sugar of lead. The pyrolignic acid should be employed; for, with an impure acid, the product of pure salt is small, and the quantity of mother-water is increased. The addition of a small quantity of alcohol to the solution, after it has been duly evaporated, is said to improve the beauty of the crystals. The mother-water (which probably is essentially the same with Goulard's extract of lead) may also be made to furnish pure crystals, by adding to it a fresh portion of acetic acid; for, without that precaution, it furnishes only a very heavy, yellow, pulverulent mass.

The manufacture of acetate of lead is conducted more economically when the oxide is dissolved in the acid at the same time that it is prepared, which is done by alternately inserting each half of plates of lead in acetic acid. The oxide is formed on the half out of the acid, by the action of its vapour, and is dissolved when it is immersed. The acid is known to be saturated when its appearance becomes milky.

Acetate of lead has a sweet styptic taste. It has a white colour, and crystallizes in flat parallelopipeds, terminated by a wedge, or more commonly in shining needles. It is soluble in pure water and in alcohol; deaquesces slightly in the air, and is decomposed by heat and light. It is decomposed by the alkalies, by most of the earths and acids, and partially even by water containing carbonic acid. It is blackened by sulphuretted hydrogen.

Crystallized acetate of lead consists of one prime protoxide of lead 112, one prime acetic acid 50, and three primes water 27=189, and ought to be yielded by 134 of carbonate of lead.

Med. use.—The internal use of acetate of lead is to be resorted to only under urgent circumstances, and with great caution. Yet it is remarkable, that when large quantities have been taken at once by accident, no bad consequences have followed. The effects of its gradual introduction with food are well known, and must warn us from continuing its internal exhibition for any length of time. Its use has been revived in Paris in pulmonary hæmorrhage and in dysentery, often combined with opium. The dose is half a grain or a grain every two or three hours till it succeed, or its continuance become unsafe. It forms, however, a very valuable external application in superficial and phlegmonic inflammations, bruises, and diseases of the skin. It is always applied in solution, either simply, or by means of cloths soaked in it, or mixed with bread-crumb. A drachm, with five ounces of any distilled water, forms a strong solution, and with ten ounces of water, a weak solution. If common water be used, the addition of about a drachm of acetic acid will be necessary to keep the lead in solution.

Off. Prep.—Unguentum plumbi acetatis, *D. E.* Acidum aceticum forte, *E.* Solutio acetatis zinci, *E.*

LIQUOR PLUMBI SUBACETATIS. *Dub.*

Solution of Subacetate of Lead *.

Take of Semivitrified oxide of lead, one part;
Distilled vinegar, twelve parts.

Boil to eleven parts in a glass vessel; leave the liquor at rest until the fæces have subsided, and then filter it.

Lond.

Take of Semivitrified oxide of lead, two pounds;
Dilute acetic acid, one gallon.

Mix and boil to six pints, constantly stirring, then set it aside until the fæces have subsided, and strain.

THE difference of the proportions used by the two colleges is striking; the London College using thrice as much lead as the Dublin; Mr Phillips asserts, a gallon of distilled vinegar, sp. gr. 1.007, will dissolve only ten of the twenty-four ounces ordered by London, while the bulky residuum retains much of the solution. The proportions of the Dublin were settled by experiment by Dr Barker. Its colour varies according to the acid used. Made with pyrolignic acid, it is almost colourless; with good distilled vinegar, it is of a straw colour, with a slight admixture of green, and has a sp. gr. of 1.22; and it is a dense solution of a deep brown colour, when the acid which remains after the distillation of vinegar is employed.

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* *Syn.* Acetum plumbicum, Acetum saturninum, Liquor plumbi acetici basici, Liquor subacetatis plumbici, Extractum saturni, Subacetas plumbi liquidus, Acetum lithargyri.

Scheele shewed that a solution of sugar of lead was converted into Goulard, by allowing it to act for a day on a plate of lead; and Dr Bostock ascertained it to be the saturated solution of a salt, consisting of one prime acetic acid 50, and two primes of protoxide of lead 224, and one of water 9 = 283; or a subacetate or diacetate of lead.

Med. use.—Goulard is only used externally, and diluted, and by many is preferred as a lotion to the solution of acetate of lead. It is in some respects preferable, as in the perfect saturation of the acid, and its want of tendency to crystallize, which is sometimes troublesome, with sugar of lead; but it has the inconvenience of being decomposed by many more substances.

Off. Prep.—Liquor plumbi subacetatis dilutus, *L. D.*

LIQUOR PLUMBI SUBACETATIS COMPOSITUS. *Dub.*
Compound Solution of Subacetate of Lead.

Take of Liquor of subacetate of lead, one drachm;
Distilled water, one pint;
Weaker spirit of wine, one drachm.
Mix.

LIQUOR PLUMBI SUBACETATIS DILUTUS. *Lond.*
Diluted Solution of Subacetate of Lead.

Take of Solution of subacetate of lead, one fluidrachm;
Distilled water, one pint;
Proof-spirit, one fluidrachm.
Mix.

IT is convenient to have an officinal dilute solution ready for use. The spirit of wine is probably added to retard spontaneous decomposition without rendering it too stimulant; but the proportion appears to be small.

CHAP. XIII.—TIN.

STANNI PULVIS. *Dub.*
Powder of Tin.

Take of very pure Tin, any quantity.

Having melted it over the fire, agitate it strongly, until it be reduced to powder, which is to be passed, when cold, through a sieve.

IN small quantity, tin is easily granulated by pouring it when melted into a box, having its inside well rubbed with chalk, and agitating it till it congeal. The chalk is then washed away, and the fine powder separated by sifting. In manufactories there is a more expeditious process: Melted tin is poured into a very wide-bottomed iron pot, and then agitated by means of a new birchen-broom. The metal is thus minutely divided.

Med. use.—It is occasionally employed as a remedy against worms, particularly the tænia. The general dose is from a scruple to a drachm. Dr Alston says, its success in tænia chiefly depends on its being given in much larger quantities. He directs an ounce of the powder to be taken on an empty stomach, mixed with four ounces of molasses; next day, half an ounce; and the day following, half an ounce more; after which a cathartic is administered. He says, the worms are usually voided during the operation of the purge, but that the pains of the stomach occasioned by them are removed almost immediately upon taking the first dose of the tin.

CHAP. XIV.—ZINC.

OXYDUM ZINCI. *Ed.*
Oxyde of Zinc *.

Let a large crucible be placed in a furnace filled with live coals, so as to be somewhat inclined towards its mouth; and when the bottom of the crucible is moderately red, throw into it a bit of zinc, about a drachm in weight. The zinc soon inflames, and is, at the same time, converted into white flakes, which are to be from time to time removed from the surface of the metal with an iron spatula, that the combustion may be more complete; and at last, when the zinc ceases to flame, the oxide of zinc is to be taken out of the crucible. Having then put in another piece of zinc, the operation is to be repeated, and may be repeated as often as is necessary. Lastly, the oxide of zinc is to be prepared in the same way as the carbonate of zinc.

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* Zincum oxydatum album, Zincum calcinatum, Oxydum zincum, Flores zinci, Magisterium zinci ustum.

Dub.

Take of Zinc, broken into pieces, any quantity.

Throw it at different times into a sufficiently deep crucible, heated red hot, and placed with its mouth inclined towards the mouth of the furnace. After each time that any zinc is thrown in, cover the crucible with another inverted over it, but loosely, so that the air may have access to the zinc. Preserve the white and very light sublimed powder for use.

Lond.

Take of Sulphate of zinc, one pound;
Liquor of ammonia, one pint, or what may be required;
Distilled water, one pint.

Dissolve the sulphate of zinc in the water, and add of the liquor of ammonia what may be required to precipitate the whole oxide of zinc. Having decanted the supernatant fluid, wash the precipitate repeatedly with distilled water, and dry it completely in a sand-bath.

The former of these two processes is an instance of simple oxidizement. At a red heat, zinc attracts the oxygen of the atmosphere so strongly, that it is quickly covered with a crust of white oxide, which prevents the air from acting on the metal below; and therefore we are desired to operate only on small pieces at a time, and to place the crucible so that we may easily take out the oxide formed, and introduce fresh pieces of zinc. As soon as the crust of oxide is broken, or removed, the zinc inflames, and burns with a brilliant white, or greenish-blue flame, being at the same time converted into very light flocculi. To save these as much as possible, we are directed to use a very deep and large crucible, and to cover it with an inverted crucible. But as we must not cover it so as to prevent the access of the air, it is doubtful whether the latter precaution be of much service. The greater part of the zinc is, however, oxidized in the crucible, without being previously converted into vapour; and as this portion of the oxide is always mixed with particles of zinc, it is necessary to separate them by trituration and elutriation.

According to my French annotator, this process succeeds better, and is quicker, when all the zinc which is to be converted into oxide is put at once into the same crucible, taking care, however, that the crucible be not more than two-thirds filled. The cover of the crucible is placed so that the air may have free access. The heat is then to be applied; the zinc is not long in melting; it then gets red and afterwards catches fire. The oxide forms at the surface of the melted metal in a light, white, spongy mass, which is to be taken out by a long-handled ladle; a well-regulated temperature is to be sustained, and the oxide is to be continually removed as soon as it is formed. The recommendation not to operate but on small pieces, for fear of the oxidation being stopped by the oxide covering the surface, is wrong, because zinc is volatile, and its vapour always rises and is burnt in the empty part of the crucible.

In the process of the London College, the ammonia unites with the sulphuric acid, and the pure oxide of zinc is precipitated in the form of a very fine white powder. I have not repeated the London process carefully, but Mr Phillips remarks, that the quantity of water prescribed is insufficient to dissolve the sulphate of zinc, unless at a boiling heat, which is attended with inconvenience, and that the oxide is readily dissolved by excess of ammonia.

Mr Phillips had previously recommended the precipitation by subcarbonate of potass; but this process does not, say the translators, answer the end; *first*, because it is not the oxide which is thus obtained, but rather a sub-carbonate; *secondly*, the state of division of the particles is no longer the same, and there are many purposes for which the subcarbonate cannot be substituted for the flowers of zinc.

The protoxide of zinc is of a pure white colour, without smell or taste, infusible and fixed in the fire, insoluble in water or alcohol, and entirely soluble in most of the acids. The presence of lead in it is detected by sulphuric acid, which forms, in that case, an insoluble sulphate of lead. The protoxide of zinc contains 34 zinc and 8 oxygen = 42.

Med. use.—White oxide of zinc is applied externally as a detergent and exsiccant remedy. With twice its weight of axunge, it forms an excellent application to deep chops, or excoriated nipples.

It is also used internally. In doses from one to seven or eight grains, it has been much celebrated in the cure of epilepsy, and several spasmodic affections; and there are sufficient testimonies of its good effects, where tonic remedies in those affections are proper.

Off. Prep.—Unguentum oxidi zinci, *D. E. L.*

ZINCI CARBONAS IMPURUS PRÆPARATUS. *Ed.*

Prepared Impure Carbonate of Zinc *.

The impure carbonate of zinc, after being roasted by those who make brass, is to be pulverized in an iron mortar, and levigated on a prophyry stone with a little water, and then put into a capacious vessel and water poured upon it, which, after frequent agitation, is to be poured off while loaded with minute powder. The subtile powder, which subsides on allowing the water to stand at rest, is to be dried.

Dub.

Reduce calcined impure carbonate of zinc to powder, and separate the impalpable parts in the same manner that is directed for the preparation of chalk.

CALAMINA PRÆPARATA. *Lond.*

Prepared Calamine.

Burn the calamine; then triturate it; lastly, reduce it to an impalpable powder, in the manner directed for the preparation of chalk.

As this preparation of zinc is intended for external application, and often to very tender surfaces, too much pains cannot be bestowed in reducing it to an impalpable powder.

Med. use.—It is sprinkled dry upon intertrigo, excoriations, and ichorous ulcers.

Off. Prep.—Unguentum calaminæ, *D.* Ung. carb. zinci impuri, *E.* Ceratum calaminæ, *L.*

OXIDUM ZINCI IMPURUM PRÆPARATUM. *Ed.*

Prepared Impure Oxide of Zinc †.

It is prepared as the impure carbonate of zinc.

THIS oxide is also prepared for external use only.

Med. use.—It is a common application to the intertrigo of infants, dusted dry on the part through muslin.

Off. Prep.—Unguent. oxydi zinci impuri, *E.*

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* *Syn.* Zincum oxydatum carbonicum.

† *Syn.* Tutia præparata, Oxycarbonas zinci impurus præpar. Nihilum griseum.

SULPHAS ZINCI. *Ed.*
Sulphate of Zinc *.

Take of Zinc, cut into small pieces, three parts;
Sulphuric acid, five parts;
Water, twenty parts.

Mix them, and when the effervescence is finished, digest the mixture, for a little, on hot sand; then strain the decanted liquor through paper, and, after proper evaporation, set it apart, that it may crystallize.

Dub.

Take of Zinc in bits, thirteen parts;
Sulphuric acid, twenty parts;
Water, one hundred and twenty parts.

Put the zinc into a glass vessel, and gradually pour on it the acid previously diluted with water. When the effervescence has ceased, digest for a short time; and, after due evaporation of the filtered liquor, set it aside to crystallize.

Lond.

Take of Zinc, broken into bits, four ounces;
Sulphuric acid, six ounces, by weight;
Water, four pints.

Mix in a glass vessel; and after the effervescence has ceased, strain the solution through paper, then evaporate to a pellicle, and set it aside to crystallize.

SULPHATE of zinc is chiefly found native in the mines of Goslar, sometimes in transparent pieces, but more commonly in the form of a white efflorescence, which is dissolved in water, and afterwards reduced, by evaporation and crystallization, into large masses. But the sulphate of zinc of commerce is never pure, always containing iron, cadmium, copper, and a little lead. From the mode of its preparation, there is also a deficiency of acid and water of crystallization. A pure sulphate of zinc may be prepared according to the direction of the colleges, in which the zinc is oxidized by the decomposition of the water, and dissolved in the acid, while hydrogen gas is evolved; but we believe this process is very rarely practised, especially as the common sulphate of zinc may be sufficiently purified by exposing it in solution to the air, by which means red oxide of iron is precipitated, and by digesting it upon pure zinc, which precipitates the other metals. It may also be purified by simply repeated crystallizations, or by adding to the concentrated warm solution, oxide of zinc, which takes the place of other metals.

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* *Syn.* Zincum sulphuricum, Sulfas zinci purus, Sulphas zincicum crystallizatum, Vitriolum album, Vitriolum zinci.

Sulphate of zinc crystallizes in tetrahedral prisms, terminated by pyramids. It has a metallic styptic taste; effloresces slowly when exposed to the air. It is soluble in 2.5 parts of water at 60°, and in much less boiling water. It is not soluble in alcohol. It is decomposed by the alkalies, earths, and hydrosulphurets. It consists of 42 oxide of zinc, 40 acid, and 63 water of crystallization = 145.

Med. use.—Sulphate of zinc, in doses from ten grains to half a drachm, operates almost instantly as an emetic, and is at the same time perfectly safe. It is therefore given when immediate vomiting is required, as in cases where poison has been swallowed. By employing it internally, in smaller doses, it acts as a tonic; and some think it, in every case, preferable to the oxide of zinc.

Externally, it is used as a styptic application, to stop hæmorrhagies, diminish increased discharges, as gonorrhœa, and to cure external inflammations, arising from debility and relaxation of the blood-vessels, as in some cases of ophthalmia. It is often prescribed in injections and collyria.

Off. Prep.—Solutio sulphatis zinci, *E.* Liquor aluminis comp. *L.* Solutio acetatis zinci, *E. D.*

SOLUTIO SULPHATIS ZINCI. *Ed.*

Solution of Sulphate of Zinc *.

Take of Sulphate of zinc, sixteen grains;
Water, eight ounces;
Diluted sulphuric acid, sixteen drops.

Dissolve the sulphate of zinc in the water; then, having added the acid, filter through paper.

THE acid is here added to dissolve the excess of oxide of zinc, which the common sulphate often contains. This solution is of a strength proper for injecting into the urethra, in gonorrhœa, or applying to the eyes in chronic ophthalmia.

LIQUOR ALUMINIS COMPOSITUS. *Lond.*

Compound Solution of Alum †.

Take of Alum,
Sulphate of zinc, of each half an ounce;
Boiling water, two pints.

Dissolve the alum and sulphate of zinc together in the water, and filter through paper.

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* *Syn.* Solutio sulphatis zincici.

† *Syn.* Aqua aluminosa Bateana.

It is used for cleansing and healing ulcers and wounds, and for removing cutaneous eruptions, the part being bathed with it hot three or four times a-day. It is sometimes likewise employed as a collyrium, and as an injection in gonorrhœa and fluor albus.

SOLUTIO ACETATIS ZINCI. *Ed.*
Solution of Acetate of Zinc *.

Take of Sulphate of zinc, one drachm;
Acetate of lead, four scruples;
Distilled water, twenty ounces.

Dissolve each of the salts separately in ten ounces of water. Mix the solutions; and after the impurities have subsided, filter the liquor.

ZINCI ACETATIS TINCTURA. *Dub.*
Tincture of Acetate of Zinc.

Take of Sulphate of zinc,
Acetate of potass, of each one part.

Triturate them together, and add sixteen parts of rectified spirit. Macerate for a week, with occasional agitation, and filter through paper.

THESE are both cases of double elective attraction. In the Edinburgh formula, the lead combines and forms an insoluble compound with the sulphuric acid, while the zinc unites with the acetic acid, and remains in solution.

When crystallized acetate of lead and sulphate of zinc are triturated together, the mixture presently becomes moist, which is owing to the new compounds retaining less water of crystallization than the original salts.

Acetate of lead contains in its crystals 3 primes of water of crystallization, and sulphate of zinc 7; but sulphate of lead contains none, and acetate of zinc 7, consequently 3 are set free.

In the Dublin process acetate of zinc and sulphate of potass are formed, and they are separated by using rectified spirits as the solvent, which dissolves the acetate of zinc, and leaves the sulphate of potass.

The acetate of zinc may be obtained by evaporation, in talcy crystals. It is soluble in water, and is decomposed by heat. It is not poisonous.

Med. use.—The solution of acetate of zinc is, with many practitioners, deservedly much esteemed as an astringent collyrium and injection. The solution in spirit of wine of the

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* *Syn.* Zincum oxydatum aceticum.

Dublin College is stronger and more stimulant than that in water of the Edinburgh.

CHAP. XV.—ALCOHOL, ETHER, AND ETHEREAL SPIRITS.

ALCOHOL. *Lond.*

Alcohol [*].

Take of Rectified spirit of wine, one gallon;
Subcarbonate of potass, three pounds.

Put one pound of the subcarbonate, previously heated to 300° Fahr. into the spirit, and macerate for twenty-four hours, frequently stirring them; then decant the spirit, and add the remainder of the subcarbonate of potass heated to the same degree; and, lastly, distil off, in a water-bath, the alcohol, which is to be kept in a well-corked bottle.

The specific gravity of alcohol is to that of distilled water as 815 to 1000.

Dub.

Take of Rectified spirit, one gallon;
Pearlashes, dried and still warm, three pounds and a half;
Muriate of lime dried, one pound.

Add the pearlashes, previously reduced to powder, to the spirit, and digest the mixture in a close vessel for seven days, frequently agitating it; then pour off the supernatant spirit; mix with it the muriate of lime; and, lastly, distil with a moderate heat, until the residuum in the retort begins to grow thick.

The specific gravity of this spirit is to that of distilled water as 810 to 1000.

THE Edinburgh College give no directions for the preparation of a very strong alcohol, as it is never used in pharmacy; but it is perhaps to be regretted that they have given the title of alcohol to a liquid which is not the alcohol of chemists, although in their last edition they add epithets to characterize its state.

The affinity of alcohol for water is so very strong, that it cannot be obtained entirely free from it by simple distillation. Its sp. gr. cannot be reduced in this way below 825. We must therefore abstract the water by means of some substance which has a stronger affinity for it than alcohol has.

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[*] *Syn.* Alcohol absolutum, Spiritus vini rectificatissimus.

The London College use subcarbonate of potass. When a certain portion of this salt is mixed with rectified spirit, it attracts the water, and being insoluble in alcohol, the deaquated alcohol swims over the alkaline solution: this is decanted off, and a second quantity of salt of tartar added, which attracts more water, but not enough to dissolve it, and it now remains as a granulated salt with still stronger spirit floating over it. The spirit now contains no alkali, and turmeric paper is not affected by it; but to separate it entirely distillation is employed. The salt of tartar may be recovered by evaporation, and perfectly pure.

The process of the Dublin College is more complicated. They first use subcarbonate of potass, and in their last edition even in larger quantity than the London College. The alcohol is thus already very much stronger. In this spirit muriate of lime is dissolved; and as a second deaquating addition, it is preferable to more salt of tartar; because it is soluble in alcohol, and therefore comes in contact with every particle of water in the spirit. By distillation, if not continued too long, the alcohol rises, while the water is retained by the salt. But even yet, the alcohol is not absolutely without water; for it may be prepared of 7947 at 60°, or 791 at 68°.

Spirits may be very much strengthened by using a series of condensers, and keeping those near the still at a pretty high temperature, by which contrivance great part of the aqueous vapour, with little spirit, is condensed in them, while the strong spirit passes over to be condensed in the most remote receiver, which must be kept very cold.

The celebrated anatomist Soemmering first made known a singular fact in regard to the passage of fluids through various coverings, which he had observed in his endeavours to prevent the wasting of the fluids in which he kept his preparations. He found generally that fluids readily passed through covers with which they had some chemical affinity, and were retained by those which repelled them. Thus, when dilute spirit was confined by bladder, the water escaped and the alcohol was retained; but when confined by linen covered with caoutchouc varnish, the alcohol passed through, and the water was retained. This led him to propose, as a chemical means of rectifying alcohol, to suspend it in bladders in a place where the temperature was warm and equal, and to improve wines by tying up the mouths of the bottles with bladder, instead of closing them with corks and rosin. Others have in some measure confirmed or extended his ideas. In one experiment, not indeed made with every precaution necessary to obtain an accurate result, I satisfied myself that Soemmering's method will not answer *practically* for the rectification of weak spirits.

In the Royal Society of this city a paper was read by Mr Graham, describing a very ingenious and new method of rendering spirit stronger, and indeed of procuring absolute alcohol. It depends upon the strong attraction which lime has for water. He inclosed four ounces of spirit of specific gravity 825 at 60° Fahr. under the receiver of an air-pump, in which were also inclosed about twelve ounces of unslaked lime, and exhausted the air. The specific gravity was taken every twenty-four hours, and it underwent the following changes:

Day 1st,	2d,	3d,	4th,	5th,	6th,	7th,
.825	.817	.809	.804	.799	.797	.796

This is the absolute alcohol of Richter. Dr Hope repeated the experiment, and in fourteen days reduced spirit of .835 to below .800. It is necessary for the success of this process that the temperature of the place should not vary much, as otherwise distillation of the spirit takes place by its occasional condensation on the plate of the air-pump, and cold side of the receiver; and the quantity of lime must be sufficient to absorb the whole water, but not in great excess, otherwise the alcohol is also absorbed by it.

Med. use.—Pure alcohol is not used in medicine, but it is an extremely pungent stimulus; and it inflames and blisters the part to which it is applied, when prevented from evaporating, which it does rapidly with the production of intense cold. Taken internally, its effects on an empty stomach, if undiluted, even in small quantity, might prove fatal. In other circumstances its effects would coincide with those of rectified spirits.

Off. Prep.—Tinctura acetatis ferri cum alcohol, *D.*

ÆTHER SULPHURICUS. *Ed.*

Sulphuric Ether *.

Take of Sulphuric acid,
Stronger alcohol, each thirty-two ounces.

Pour the alcohol into a glass retort, capable of sustaining a sudden heat, and add to it the acid, in an uninterrupted stream. Mix them by degrees, shaking them gently and frequently, and instantly distil from sand, previously heated for the purpose, into a receiver kept cool with water or snow. The heat must likewise be so managed, that the liquor shall boil as soon as possible, and continue to boil till sixteen ounces are drawn off, when the retort is to be removed from the sand.

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* *Syn.* Naphtha vitrioli.

To the distilled liquor add two drachms of potass, and distil from a very high retort, with a very gentle heat, into a cool receiver, until ten ounces have been drawn off.

If sixteen ounces of stronger alcohol be poured upon the acid remaining in the retort after the first distillation, and the distillation be repeated, more Ether will be obtained; and this may be repeated several times.

Dub.

Take of Sulphuric ethereal liquor, twenty ounces, by measure;
Carbonate of potass, dried and powdered, two drachms.

Mix them, and distil, with a very gentle heat, twelve ounces, by measure, from a very high retort, into a cooled receiver.

Its specific gravity is 765, water being 1000.

Lond.

Take of Rectified spirit,
Sulphuric acid, of each one pound and a half.

Put the spirit into a glass retort, and gradually add to it the acid, shaking them frequently, and taking care that the temperature, during the mixture, do not exceed 120° Fahr.

Then cautiously place the retort in a sand-bath, previously heated to 200°, so that the liquor may boil as quickly as possible, and the *Ether* may be distilled over into a tubulated receiver, to which a vessel, cooled with snow or ice, is fitted. Continue the distillation until a heavier fluid begin to come over, which is seen in the bottom of the receiver, below the ether.

Pour twelve ounces more of rectified spirit upon the liquor remaining in the retort, and repeat the distillation of ether in the same manner.

Off. Prep.—Spiritus ætheris sulphurici, *L. E.*

ÆTHER RECTIFICATUS. *Lond.*
Rectified Ether.

Take of Sulphuric ether, fourteen fluidounces;
Fused potass, half an ounce;
Distilled water, eleven fluidounces.

Dissolve the potass first in the two fluidounces of the water, and add the ether to it, shaking them constantly until they are mixed. Then with a heat of about 120°, distil from a large retort into a cold receiver, twelve fluidounces of rectified ether. Mix the distilled liquor with eleven ounces of the water, and let it settle. Then decant the supernatant ether, and keep it in a well-corked bottle.

ÆTHER SULPHURICUS CUM ALCOHOLE. *Ed.*
Sulphuric Ether with Alcohol [*].

Take of Sulphuric ether, one part;
Stronger alcohol, two parts.
Mix them.

SPIRITUS ÆTHERIS SULPHURICI. *Lond.*
Spirit of Sulphuric Ether.

Take of Sulphuric ether, half a pint;
Rectified spirit, a pint.
Mix them.

LIQUOR ÆTHEREUS SULPHURICUS. *Dub.*
Sulphuric Ethereal Liquor.

Take of Rectified spirit,
Sulphuric acid, each thirty-two ounces.

Put the spirit into a glass retort capable of supporting a sudden heat, and pour upon it the acid, in a continued stream. Mix them gradually, and distil into a cooled receiver, with a sufficient and quick heat, twenty ounces of liquor, by measure.

If sixteen ounces of rectified spirit of wine be poured upon the acid residuum in the retort, it will again afford, by distillation, sulphuric ethereal liquor.

Off. Prep.—Æther sulphuricus, *D.*

THE products rising from the decomposition of alcohol by the action of the acids are extremely curious and interesting. The first step to the true theory of etherification was made by Fourcroy and Vauquelin, and Gay-Lussac has completed it. To understand it, we must recapitulate the composition of alcohol, and contrast it with that of ether, in regard to the volumes of the gases of which they are composed.

	Volume.		Olef. gas.		Aq. vapour.	Sp. gr. calc.	By expt.
Alcohol vapour	1	=	1	+	1	1.599	1.613
Ether vapour	1	=	2	+	1	2.5694	2.581

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[*] *Syn.* Spiritus sulphurico-æthereus, Æther sulphuricus alcoolisatus, Liquor anodynus mineralis Hoffmanni, Æther spirituos.

We thus see that the difference between the vapour of alcohol and of ether is, that in the latter two volumes of olefiant gas are united with one of aqueous vapour, and in the former with one, and that the volume of the aqueous vapour is not altered by its combination with either one or two volumes of olefiant gas. The calculated sp. gr. correspond as nearly with the experimental as can be expected in such inquiries.

Comparing the weight of their elementary atoms, we find a similar coincidence.

	Atoms or Primes.					Weight.						
	Oxyg.		Hyd.		Carb.	Oxyg.		Hyd.		Carb.		
Alcohol	1	+	3	+	2	1	+	0.375	+	1.5	=	2.875
Ether	1	+	5	+	4	1	+	0.625	+	3.	=	4.625

Or, in other terms, alcohol consists of one prime of water and two primes of carburetted hydrogen, and ether of one and four primes of the same ingredients. To convert alcohol into ether, it is therefore necessary to combine it with two additional primes of carburetted hydrogen, or, what is the same thing, to deprive two primes of alcohol of one prime of water, and this is the mode in which sulphuric acid acts. In consequence of its strong affinity for water, the alcohol undergoes partial decomposition, and part of its oxygen and hydrogen unites to form water to satisfy the affinity of the acid.

A new theory has been proposed by M. Dubit. The alcohol in the process of etherization is divided into two parts; the first passes into the state of ether, by losing oxygen and hydrogen in the proportions necessary for forming water; the hydrogen causes the sulphuric acid to pass into the state of sulphuretted hydrogen, and the oxygen by uniting to the second portion of alcohol constitutes a new vegetable matter. The sulphurous acid gas, the carbonic acid gas, the ethereal oil, the carbonated hydrogen gas, and the water formed, and the carbon deposited, arise from the reaction of the elements of the vegetable matter, and from the decomposition of the sulphuretted hydrogen.

The most convenient way of mixing the ingredients is to put the alcohol, previously heated, into a tubulated retort, and with a long-tubed funnel, reaching down to the bottom of the retort, to pour in the acid. By cautious agitation, the two fluids unite, and heat is produced, which may be taken advantage of in the distillation, if we have a sand-bath previously heated to 200°, to receive the retort. The receiver is to be immediately connected with the retort, and the junction closed with linseed meal lute, covered with wet bladders. A tubulated receiver, with a bent tube dipping into mercury, is preferable; but an ordinary receiver will do, if it be large, and immersed in very cold water, or covered with crushed ice.

Immediately on mixing the acid with the alcohol, there is a considerable increase of temperature, and a slight disengagement of alcohol, somewhat altered, and having an aromatic odour. On placing the retort in the sand-bath, a portion of pure alcohol first comes over; and when the mixture in the retort boils, the ether rises, and is condensed in thin, broad, straight streaks, having the appearance of oil.

The distillation is directed to be performed with an equal and very gentle, but quick heat. Mr Brande informs us, that with a temperature of 212°, and even 220°, very little else than alcohol comes over, and that from 250° to 280° are necessary for the generation of ether; while Mr Phillips says, that when the distillation of 10 ounces of product was completed in three hours, its sp. gr. was 0.791; but when it occupied almost nine hours, its sp. gr. was only 0.782. Until the liquor which passes over into the receiver amounts to about half, or somewhat more than half, of the alcohol operated on, it consists almost entirely of alcohol and ether, and there has been no disengagement of any permanently elastic fluid; but now the production of ether ceases, and sulphureous vapours begin to arise, which condense in irregular streaks, or in drops, and is the heavier fluid seen below the ether: we must therefore either put a stop to the process, or change the receiver.

Mr Phillips has ascertained the sp. gr. of the products at different periods of the distillation. From 16 oz. of acid sp. gr. 1.837, and an equal weight of spirit sp. gr. 0.830, he got 12 ounces of product; 4 of ethereal spirit of sp. gr. 0.779; 4 more of sp. gr. 0.753; then 2½ of yellow sulphurous spirit of sp. gr. 784; and, lastly, 1½ of heavy fluid of 0.981.

The decomposition of the whole alcohol seems to be the reason why ether ceases to be produced; for if, as the colleges direct, half the original quantity of alcohol be added, more ether is produced. At the same time, it would appear, that the power of the acid to form ether is diminished, for the second product is heavier than the first.

Mr Phillips, from a pound and a half each of acid and of rectified spirit got floz. 12 product, of which flodr. 6 were the heavier fluid indicated, and floz. 11.26 of ether, specific gravity 0.768; and by a second distillation, after 12 ounces more of spirit had been added to the residuum, he got about the same quantity of ethereal product, of 0.807.

Dr Lewis, in 1748, published his discovery, that the residuum in the distillation of sulphuric ether was capable of converting fresh additions of alcohol into ether. He therefore anticipated without doubt M. Cadet, who did not publish till 1774.

The process of etherification is more advantageous upon a large scale. At Apothecaries Hall, as Mr Brande informs us, 100 lbs. sulphuric acid and 100 rectified spirit afford lbs. 52 ether of sp. gr. .761; and 50 lbs. spirit added to the residuum furnish lbs. 46—52, of ether .765. The lbs. 100 of impure ether thus obtained afford, by rectification, from lbs. 55—58 of rectified ether of .733.

At Apothecaries Hall, the still is of cast iron lined with lead, and heated by high pressure steam, passing through a contorted pipe at the bottom of the still, by which the mixture is very rapidly raised to its boiling point, a larger product obtained, and all danger avoided, as the steam boiler is in another apartment.

The ether may be rectified or separated from the alcohol, water, and sulphureous acid, with which it is always mixed, by redistilling it with a very gentle heat, after mixing it with potass, which combines with the acid, water, and alcohol. The alkali ought to be added in substance according to the directions of the Edinburgh College, not in solution as prescribed by that of London. In practice, subcarbonate of potass is used for the rectification of ether, from which it is redistilled, as long as it is of sufficient strength.

For medicinal purposes, ether of 730–740 will serve, but it should not exceed 750. It is said to have been procured as low as 632, but Mr Brande could not get it lower than 700. When pure, sulphuric ether is a transparent colourless fluid, of a very fragrant odour, and hot pungent taste: It freezes and crystallizes at —46°. It boils at 98°, and in vacuum at —20°. It is very soluble in air, and during its evaporation it produces an intense degree of cold. It is soluble in ten parts of water, and in alcohol in every proportion. It dissolves a small portion of phosphorus, and the solution is decomposed by alcohol. It absorbs nitrous gas, combines with ammonia, and dissolves the volatile oils, resins, and caoutchouc. Ether is extremely inflammable, and burns with a white flame. Its vapour explodes when kindled in contact with oxygen gas. It is decomposed by sulphuric acid, chlorine, and by being transmitted through a red-hot porcelain tube.

Med. use.—Ether taken internally is an excellent antispasmodic, cordial, and stimulant. In catarrhal and asthmatic complaints, its vapour is inhaled with advantage, by holding in the mouth a piece of sugar on which ether has been dropt. It is given as a cordial in nausea, and in febrile diseases of the typhoid type; as an antispasmodic in hysteria, and in other nervous and painful diseases; and as a stimulus in soporose and apoplectic affections. Regular practitioners most frequently give only half a drachm or a drachm for a dose; but empirics have sometimes ventured upon much larger quantities, and with incredible benefit. When applied externally, it is capable of producing two very opposite effects, according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied, closely with the hand, it proves a powerful stimulant and rubefacient, and excites a sensation of burning heat. In this way it is frequently used for removing pains in the head or teeth. On the contrary, if it be dropt on any part of the body, exposed freely to the contact of the air, its rapid evaporation produces an intense degree of cold; and as this is attended with a proportional diminution of bulk in the part to which it is applied, in this way it has frequently facilitated the reduction of strangulated hernia.

The mixture of ether with alcohol, whether prepared directly by mixing them as the Edinburgh College direct, or in the impure state in which it comes over in the first part of the process for distilling ether, possesses similar virtues with ether, but in an inferior degree.

OLEUM ÆTHEREUM. *Lond.*
Ethereal Oil *.

After the distillation of sulphuric ether, continue the distillation with a reduced heat, until a black froth swell up. Immediately remove the retort from the fire, and pour water upon the liquor which remains in the retort, that the oily matter may float. Skim off the oily matter, and mix it with as much lime water as will saturate the acid in it. Shake them together; and, lastly, collect the ethereal oil after it has separated.

SPIRITUS ÆTHERIS SULPHURICI COMPOSITUS. *Lond.*
Compound Spirit of Sulphuric Ether.

Take of Spirit of sulphuric ether, one pint;
Ethereal oil, two fluidrachms.
Mix them.

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* *Syn.* Oleum vini.

LIQUOR ÆTHEREUS OLEOSUS. *Dub.*
Oily Ethereal Liquor.

Distil to one-half, with a moderate heat, what remains in the retort after the distillation of the vitriolic ether.

IF we continue the distillation after the ether is no longer furnished unmixed, the residuum in the retort begins to blacken, and the products are sulphureous acid, acetic acid, water, and oil of wine, accompanied towards the end by olefiant gas. At last the matter in the retort, which has now become thick and black, swells up, and prevents us from carrying the process further.

Mr Phillips says, that he has not been able to prepare, nor even to purchase the ethereal liquor. What he prepared was ether mixed with sulphurous acid; and what he purchased was empyreumatic ether, containing neither oil nor sulphurous acid. But Mr Brande asserts, that by following the directions of the colleges, a very small portion of pure ethereal oil may be obtained, and that it may be procured in larger quantities by distilling equal measures of rectified spirit and sulphuric acid. It is best purified by washing it with weak solution of subcarbonate of potass, and he describes its properties. Its sp. gr. is 1.060. It is insoluble in water, but soluble in ether and alcohol. It has a fragrant odour, and an aromatic, bitterish, and pungent taste. In its composition and general characters it resembles the vegetable essential oils, and he has sometimes observed crystals in it.

The London and Dublin Colleges have a solution of it in spirit of sulphuric ether, but its medical effects have not been ascertained.

ÆTHER NITROSUS. *Dub.*
Nitrous Ether *.

Take of Purified nitrate of potass, and in coarse powder, one pound and a half;
Sulphuric acid, one pound;
Rectified spirit of wine, nineteen ounces, by measure.

Put the nitrate of potass into a tubulated retort, placed in a bath of cold water, and pour upon it gradually, and in different portions, the sulphuric acid and spirit, previously mixed, and allowed to cool after having been mixed. Without any external heat, or only a very slight degree of it (such as the addition of tepid water to the bath,) an ethereal liquor will begin to arise, without applying fire under it. In a short time, the heat will spontaneously increase in the retort, and a remarkable ebullition will take place, which are to be moderated, by cooling the bath with cold water. The receiver ought also to be cooled with water or snow, and furnished with a proper apparatus for transmitting the very elastic vapour (arising from the mixture, with very great force, if the heat should accidentally become too high) through a pound of rectified spirit, placed in a cooled phial.

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* *Syn.* Æther nitricus, Naphtha nitri.

Put the ethereal liquor, which has distilled spontaneously, into a phial with a ground glass stopper, and gradually add (closing the phial after each addition) as much very dry carbonate of potass in powder, as shall be sufficient to saturate the superabundant acid, according to the test of litmus. This commonly takes place on the addition of about a drachm of the salt; and in a short time, the nitrous ether will swim on the surface, and is to be separated by means of a funnel.

If it be required very pure, redistil the ether from a water-bath, at about 140°, to one-half.

Its specific gravity is 900.

Alcohol can be converted into an ether by nitric acid; but the chemical action is more complicated, and its theory not so well understood. A great deal depends upon the proportions in which they are mixed, and the temperature applied. From the mixture of three parts of strong nitrous acid, and one of alcohol, there is great increase of heat, red fumes are evolved, and oxalic acid crystallizes in the residuum. In the proportion of equal parts rapidly mixed, the reaction is so accelerated by the heat produced, that the effervescence may be called explosive, and is attended with danger; but if the action be restrained, nitric ether is one of the products. There are various ways of moderating the reaction; 1*st*, by reducing the temperature; 2*dly*, by impeding their mixture; 3*dly*, by not using the acid itself, but generating it gradually in the mixture. Dr Black contrived an ingenious method of rendering their mixture extremely slow, although put at once into the same phial. On two ounces of strong nitrous acid, put into a phial, having a conical ground glass stopper, and a weak spring fitted to keep the stopper in its place, pour slowly and gradually about an equal quantity of water, which, by being made to trickle down the sides of the phial, will float on the surface of the acid, without mixing with it; then add, in the same cautious manner, three ounces of alcohol, which, in its turn, will float on the surface of the water. By this means the three fluids are kept separate, on account of their different specific gravities, and a stratum of water is interposed between the acid and spirit. The phial is now to be set in a cool place, and the acid will gradually ascend, and the spirit descend through the water; this last acting as a boundary to restrain their action on each other. When this commences, bubbles of gas rise through the fluids, and the acid gets a blue colour, which it again loses in the course of a few days, and a yellow nitrous ether begins to swim on the surface. As soon as the formation of air-bubbles ceases, it is time to remove the ether formed; for if allowed to remain, its quantity decreases. By this method, nitrous ether is formed, without the danger of producing any explosion. The residuum of this process is still capable of forming a spirit of nitrous ether, with an additional quantity of alcohol.

By adding the acid to the alcohol in very small quantities at a time, and at considerable intervals, M. Dehne procured from 256 of alcohol, and 211 of nitrous acid, 203 of nitric ether; the residuum weighed 244 ounces: there was therefore a loss of 40. M. Dehne put the alcohol into a tubulated retort, to which a receiver was luted, and poured the acid through the tubulature, and the ether passed over into the receiver, without the application of any heat. The action did not begin until six ounces and a half of the acid were added to the alcohol, and was found to be exhausted, when, on adding more acid, it fell to the bottom in the form of green drops. I have repeatedly prepared nitric ether with great facility and safety by putting alcohol into a tubulated retort having a small long-tubed funnel introduced through a cork in the tubulature, so that the end of the funnel was immersed in the alcohol, pouring nitrous acid through this slowly, until reaction commenced, and waiting till it ceased before more acid was added in successive portions, until the whole proportion intended was added. After the spontaneous action had ceased, heat was cautiously applied as long as ether was produced. I used a Woulfe's apparatus kept very cold. The first receiver was empty, and in it the greater part of the ether condensed; the second receiver contained water; and the third alcohol, from which a bent tube gave a ready exit for the gases.

Thenard uses five connected receivers, all of them containing a saturated solution of sea salt. Without this precaution he found the fluid distilled was very impure, and was a mixture of nitric ether, alcohol, water, nitrous and acetic acids, which must have been partly owing to his not moderating sufficiently the reaction of the acid and alcohol.

The method of forming nitrous ether, now directed by the Dublin College, was first practised by M. Voigt. I have not tried it, but the theory is simple. By the action of the sulphuric acid on the nitre, nitric acid is gradually disengaged, which immediately reacts upon the alcohol, and ether is necessarily formed.

The properties of nitric ether have been detailed by M. Thenard, which coincide with my own observations. It has a pale yellow colour, like a very limpid oil; a strong ethereal smell, and a peculiar pungent taste. It is very volatile, and produces intense cold during its evaporation, and its vapour is much more elastic than that of sulphuric ether. It is very inflammable, and burns with a brilliant white flame. When simply washed with water, I found its sp. gr. to be 0.912; but it evidently contained acid. When this was removed, by saturating it with potass, it became 0.896; and when rectified, by redistillation, it became 0.866, but recovered acid properties. It is soluble in 48 times its weight of water, to which it imparts the odour of apples. It is dissolved in alcohol in every proportion; and the alcohol which I put into the third Woulfe's bottle absorbed what escaped condensation, and was converted into spirit of nitrous ether. When kept for some time, both nitric and acetic acids were formed in nitric ether.

The only analysis is by Thenard, who found in it 14.49 nitrogen, 28.45 carbon, 48.52 oxygen, and 8.54 hydrogen = 100, which does not differ much from 4 primes of carburetted hydrogen, 3 of water, and 1 of deutoxide of azote. If we suppose two of the primes of water to be only hygroscopically mixed, then nitric ether differs from sulphuric only in containing a prime of nitric oxide, a constitution of the substance which I had previously conjectured from other observations, especially its giving a deep olive colour to solutions of the proto-salts of iron.

The gas, which is evolved in great quantity, has been found by Thenard to be very complicated, consisting chiefly of protoxide of azote, mixed with deutoxide of azote, azote, carbonic, acetic, and nitrous acids, loaded with ethereal vapour. I found, that after the air of the apparatus had been expelled, protoxide of azote first came over, and then a mixture of carbonic acid, and an etherized gas. When recently prepared, this gas is inflammable, and does not form red fumes on coming into contact with atmospheric air; but when attempted to be kept over water, the water becomes acidulous, the gas is diminished in bulk about two-thirds, loses its inflammability, and is now converted into red vapours on the admission of atmospheric air.

SPIRITUS ÆTHEREUS NITROSUS. *Dub.*
Nitrous Ethereal Spirit *.

Add to the matter which remains after the distillation of the nitrous ether, the rectified spirit of wine which was employed in that operation for condensing the elastic vapours, and distil, with the greatest heat of a water-bath, to dryness. Mix the distilled liquor with the alkaline liquor which remained after the separation of the nitrous ether, and also add as much very dry carbonate of potass as shall be sufficient to saturate the predominant acid, according to the test of litmus. Lastly, distil by the medium heat of a water-bath as long as drops come over.

The specific gravity of this liquor is 850.

SPIRITUS ÆTHERIS NITROSI. *Ed.*
Spirit of Nitrous Ether.

Take of Stronger alcohol, three pounds;
Nitrous acid, one pound.

Pour the alcohol into a capacious phial, placed in a vessel full of cold water, and add the acid by degrees, constantly agitating them. Let the phial be slightly covered, and placed for seven days in a cool place; then distil the liquor with the heat of boiling water, into a receiver kept cool with water or snow, till about three pounds come over.

SPIRITUS ÆTHERIS NITRICI. *Lond.*
Spirit of Nitric Ether.

Take of Rectified spirit of wine, two pints;
Nitric acid, three ounces, by weight.

Pour the acid gradually upon the spirit, and mix them, taking care that the heat do not exceed 120°, and distil with a gentle heat twenty-four fluidounces.

THE process of the Dublin College is only applicable when nitric ether has been prepared, in which case it is economical by converting the various residues to use.

In the processes of the London and Edinburgh Colleges, the spirit of nitrous ether is the principal product. They differ from that for forming nitric ether, only in the larger proportion of alcohol employed, which renders it more manageable, and gives a mixed product of nitric ether and alcohol. But the proportion used by the two Colleges is considerably different, Edinburgh ordering only 3 of alcohol to 1 of acid, and London a little more than 8 to 1.

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* *Syn.* Spiritus nitrico-æthereus, Spiritus nitricus alcoholisatus, Spiritus nitri dulcis, Æther nitricus alcoholisatus, Æther nitricus alcoholisatus.

There is no advantage in keeping the materials mixed seven days before proceeding to distillation. If cooled and carefully mixed, I find that no action takes place until heat be applied; and we may immediately proceed to the distillation, which must be performed with a very slow and well-regulated fire, not exceeding 180°, lest a portion of undecomposed acid pass over, and spoil the product.

At Apothecaries Hall an earthenware still is used, and it is heated by steam applied to its outer surface.

The Edinburgh College directs the distillation to be continued till about three pounds come over, which is equal to the alcohol operated upon. When from the quantities ordered by the London College only 24 fluidounces are drawn off, a perfectly colourless and very slightly acid product is obtained, of sp. gr. 0.834, but immediately afterwards the spirit becomes coloured and very acid.

By performing this operation carefully in a Woulfe's apparatus, from three ounces of alcohol, specific gravity 0.841, and one ounce of nitrous acid, I got in the receiver two ounces four drachms of spirit of nitrous ether, specific gravity 0.887. Eight ounces of alcohol, contained in the first phial connected with the receiver, gained one drachm and a half, and acquired specific gravity 0.873, and eight ounces of water in the second gained 18 grains: the residuum weighed seven drachms and a half. There was therefore a loss of 2 drachms 42 grains of permanently elastic fluids.

The spirit of nitrous ether, thus obtained, is a colourless fluid, of a fragrant odour, lighter than water, extremely volatile and inflammable, possessing properties in general analogous to the spirit of sulphuric ether, but of considerably greater specific gravity, striking a deep olive, with a solution of green sulphate of iron, and often, if not always acid. By age and exposure to the air, it is gradually decomposed, and gives rise to the reproduction of nitrous acid. When this change has taken place, it may be rectified, by saturating the acid with lime-water, and redistilling the ethereal fluid.

In all probability, spirit of nitrous ether is a mixture of nitrous ether and alcohol; for, by diminishing the quantity of alcohol employed, we obtain a fluid having a similar relation to the spirit of nitrous ether that sulphuric ether has to the spirit of sulphuric ether. By adding alcohol to the residuum of nitrous ether, the Dublin College prepare their spirit of nitrous ether, in the same way as spirit of sulphuric ether is prepared from the residuum of sulphuric ether: and by mixing nitrous ether with alcohol, we obtain a fluid exactly resembling spirit of nitrous ether.

Med. use.—Spirit of nitrous ether has been long deservedly held in great esteem. It quenches thirst, promotes the natural secretions, expels flatulence, and moderately strengthens the stomach. It may be given in doses of from twenty drops to a drachm, in any convenient vehicle. Mixed with a small quantity of *spiritus ammoniæ aromaticus*, it proves a mild, yet efficacious diaphoretic, and often remarkably diuretic, especially in some febrile cases, where such a salutary evacuation is wanted. A small proportion of this spirit added to malt spirits gives them a flavour approaching to that of French brandy.

CHAP. XVI.

VEGETABILIA. *Lond.*

VEGETABLES.

Vegetables are to be gathered in their native soil and situation, in dry weather, when they are neither wet with showers nor dew; they are to be collected every year, and what are older must be thrown away.

Roots, for the most part, are to be dug up before they shoot up their leaves or stalks.

Barks ought to be gathered when they can be separated most easily from the wood.

Leaves are to be plucked after the flowers have faded, and before the seeds are ripe.

Flowers are to be gathered when just opened.

Seeds are to be collected when ripe, and before they fall, and are to be kept in their proper pericarps.

VEGETABILIUM PRÆPARATIO. *Lond.*

Preparation of Vegetables.

Vegetables, soon after they are gathered, except those which are used fresh, are to be loosely spread out, and dried as quickly as possible, with a heat so low as not to alter the colour. They are then to be preserved from the action of light and moisture in proper situations, or vessels.

Roots, which are directed to be preserved fresh, are to be buried in sand.

VEGETABILIUM EXSICCATIO. *Ed.*

The Drying of Vegetable Substances.

HERBS and flowers are to be dried by the gentle heat of a stove or common fire, in such quantities only at a time, that the process may be finished as quickly as possible; for by this means their powers are best preserved; the test of which is the perfect preservation of their natural colour.

The leaves of hemlock (*conium maculatum*) and of other plants containing a subtile volatile matter, must be reduced to powder immediately, after being dried, and afterwards kept in opaque glass phials well corked.

HERBARUM EXSICCATIO. *Dub.*

The Drying of Herbs.

Put the fresh leaves or flowers of the herb, when in flower, into paper bags, and expose them to a low degree of heat for an hour; then spread them lightly upon a sieve, and dry them as quickly as possible, taking care that the colour be not injured by too great a degree of heat; but if the herbs are to be used in the form of powder, they are to be powdered immediately, and preserved in small opaque phials well corked.

Herbs and flowers, from which waters or oils are to be distilled, should be dried as soon as they are gathered.

THE general rules for collecting, drying and preserving simples have been detailed in the first part of this work, at page 19.

In the *Pharmacopée Raisonnée*, there are some particular directions as to the collecting and drying the substances commonly used in France, from which a few useful notices may be extracted.

The root of Angelica is biennial. It should be collected in October, when the plant is twelve months old, and the leaves and shoot of the first year have decayed. After washing and drying it, the stock root, on account of its great size, should be cut into four pieces, to expedite its drying. The roots of Lovage and Celery are treated in the same manner.

Burdock root, also biennial, is collected by the herbalists during most part of the year; but the preference should be given to that collected in autumn, and of middling size. The roots of Patience (*Rumex patientia*), and Consolida (*Symphitum officinale*) are of the same nature.

Cynoglossum officinale is treated in the same way; but also, after cleaning it and cutting off the neck, it is split longitudinally, to take out the heart or *meditullium*, and to dry only the bark, in which the odour and virtues of the plant solely reside. The same is done with the root of the *Potentilla reptans.* But this method of treatment is not confined to these two roots; for in almost all, the cortical is more active than the central portion, especially when the plant is aged, in which case the wood is rejected. But when care is taken to collect the roots, the biennial when one year old, the perennial when one or two, this precaution is unnecessary.

Marshmallow root is collected in autumn, at the end of the second year. After being cleaned, it is cut longitudinally, when of large size, and is dried first in the air and afterwards in a stove. After being dry they are put into a barrel containing files, and rolled about to rub off the epidermis. In the same way the roots of the *Althæa rosea* and *Alcea rosea* are treated, and sold as substitutes.

The central portion of the root of the (false) Alkanet root, which is white, is removed, and only the cortical part, in which the whole colour resides, is dried.

Wild valerian is merely washed, has the neck cut off, and is dried, without splitting it.

One thousand parts of the following roots, when fresh, yielded, on an average, when dried,

Angelica Archang.,	263	Dahlia,	510
Arctium Lappa,	301	Inula Helenium,	187
Asparagus officinalis,	388	Rumex Acetosa,	310
Aspidium Filix mas,	500	——— Patientia,	333
Bryonia alba,	125	Symphitum officin.,	276
Cynoglossum officin.,	216	Valeriana sylvestris,	316

The buds of the Poplar are collected in the beginning of spring, when they are about to burst. They are dried in the stove with a heat gradually increased. 1000 parts yield about 385 when dried.

The twigs of Bittersweet are gathered in autumn, after the leaves have fallen off. The shoots of the year are chosen. They are split longitudinally, cut into pieces, and dried in the stove.

The only indigenous wood employed is that of the juniper. It is gathered after the fall of the leaf, cut into pieces, and dried in the stove.

The indigenous barks are commonly stripped off in autumn after the fall of the leaf. Those of the oak, horsechesnut and tamarisc, are peeled entire from branches of a certain size, of trees arrived at full vigour, and dried in this form. The bark of the elm is scraped and divided into layers. That of the elder is taken a little earlier than the others. It is deprived of its epidermis by scraping it slightly, and divided into layers before it is dried. Mezereon bark is stripped from the branches when the shrub has attained its full size; but the entire branches are also cut and dried, and the bark separated from them after maceration in vinegar or water, as it is wanted. The former is preferable.

Dried product of 1000 *parts of recent barks.*

Oak,	410	Elder,	292
Horse chesnut,	380	Willow,	450
Elm,	375	Twigs of bittersweet,	308

Leaves ought to be gathered as much as possible in dry weather, two or three hours after sunrise, that its heat may have dissipated all the humidity of the night. Only entire and perfect leaves should be dried, and therefore all worm-eaten, dirty, and etiolated leaves are to be rejected. Large and middle-sized leaves are stretched in thin layers upon riddles or frames of osiers. The leaves of smaller plants are tied up in small bundles, of which garlands are formed, and suspended one above the other, either in a loft receiving the full heat of the sun, or in a stove heated to 100° or 110°. Aromatic plants are dried at 85°, and care must be taken that the sun does not strike directly upon them.

Leaves and herbs are known to be dry when they become brittle; but as they cannot be handled in that state, they are exposed for some hours to the free air in the shade, that they may recover a little pliability.

Leaves are gathered from young plants, separated from the other parts, and dried upon riddles: as Mallow, marsh-mallow, horehound, water-trefoil. Those of Succory and Soap-wort may be tied up in garlands.

Leaves are gathered when the plants begin to flower, and dried separately from the flowers upon riddles: as Monkshood, Belladonna, Hemlock, Digitalis, Henbane, Thorn-apple, and Poison sumach.

Leaves are gathered along with the flowers, at the commencement of inflorescence, and dried upon riddles: as Borage, Ground ivy, *Solanum nigrum*, *Parietaria officinalis*, *Mercurialis annua*. The following may be tied up in garlands: Wormwood, Hyssop, Fumitory, Balm, Rue, Tansy, Sage, *Mentha Calamintha*, and *Teucrium Chamædrys*.

The flowering summits of Peppermint, Smaller centaury, Mehlor, *Hypericum perforatum*, Origanum, *Galium verum*, are gathered at the commencement of inflorescence, cut off, and divided into small bundles, each of which is put into a paper bag, to protect them from the decolorizing action of the light. These are tied up in garlands, and dried in a loft or stove. Fine flowering summits may also be dried by spreading them in thin layers upon riddles between two sheets of grey paper.

Dried product of 1000 *parts of fresh leaves.*

Aconit. Nap.	185	Mentha Calamintha,	310
Ajuga reptans,	250	——— crispa,	150
Althæa off.	130	Menyanthes trif.	140
Artemisia Absinth.,	260	Mercurialis annua,	170
——— vulgaris,	240	Parietaria officin.	220
——— Dracunculus,	260	Rhus radicans,	280
Atropa Belladon.,	140	Ruta graveolens,	225
Betonica officinalis,	140	Salvia off.	220
Borago off.	115	Sanicula,	344
Cichorium Intybus,	155	Saponaria off.	310
Citrus Aurantium,	460	Solanum nigrum,	150
Conium maculatum,	185	Tanacetum vulgare,	196
Datura stramon.	110	Teucrium Chamædrys,	295
Digitalis purpurea,	180	——— Chamæpytis,	230
Euphrasia,	312	——— Scordium,	203
Fumaria off.	170	Verbascum Thapsus,	218
Hedera terrestris,	210	Vinca pervinca,	370
Hyosciamus niger,	135	Tops of Centaur. minus,	375
Hyssopus officin.	230	——— Galium verum,	312
Malva officin.	215	——— Mentha piperita,	215
Melissa officinalis,	220		

The petals of red roses are gathered while still in the state of buds, because they are then more astringent. The calyx is separated, and the buds dried very quickly, either in a hot loft, or in a stove. When dried they are freed from stamina, fragments of the calyx, and eggs of insects, by shaking them upon a sieve, and immediately put into very close bottles.

March violets are best dried very quickly, and preserved in small bottles quite full, and accurately closed by corks pitched over. On exposure to the air they speedily lose their colour, by the spoiling of an azotized principle which they contain. This may be removed by washing them slightly in tepid water before drying them. They are then laid on a sieve to drip, and dried in a stove.

The flowers of *Anthemis nobilis*, *Matricaria Chamomilla*, Mallow, *Verbascum thapsus*, Lavender, *Calendula off.* Monkshood, Lily of the valley, *Gnaphalium dioicum*, &c. are dried along with the calyx, spread between two sheets of paper. Those of Mallow, Marshmallow, and *Verbascum thapsus* are apt to spoil, and must be preserved like those of violets.

The flowers of Chamomile, Coltsfoot, *Gnaphalium*, &c. on account of their globular form, are apt to appear dry on the surface, when they are still moist in the centre. They must therefore be kept in the stove a sufficient time, to ensure that they are perfectly exsiccated.

Product of 1000 *parts of recent flowers after being dried.*

Aconit. Nap.	250	Sambucus ebulus,	250
Anthemis nobilis,	338	Spartium Scoparium,	170
Althæa officinalis,	170	Tilia Europæa,	328
Amygdalus Persica,	155	Thymus,	340
Borago off.	96	Tussilago Farfara,	192
Calendula officin.	144	Verbascum Thapsus,	175
Citrus Aurantium,	250	Petals of Dianth. Caryoph.,	235
Convallaria majalis,	136	——— Papav. Rhœas,	84
Lamium album,	140	——— Pæonia officin.	175
Lavandula vera,	510	——— Rosa pallida,	180
Malva sylvestris,	111	——————— rubra,	330
Matricaria Parthenium,	281	——————— alba,	170
Nymphæa alba,	94	——— Viola tricolor hortens.	147
Primula veris,	178		

PULVIS SCILLÆ. *Dub.*

Powder of Squills.

Cut the bulb of the squill, after having removed the membranaceous integuments, into transverse slices; dry these with a gentle heat, (under 100°,) and reduce them to powder, which is to be kept in phials with ground glass-stoppers.

Lond.

The bulb of the squill, before drying it, is to have its arid coats peeled off, and to be cut transversely into thin slices.

Edin.

The root of the sea squill *(scilla maritima,)* after having removed its external coat, is to be previously cut transversely into thin slices. The sign of its being properly dried is, that although rendered friable, it retains its bitterness and acrimony.

THE squill has a very large scaly bulb. The outer scales are of a brown colour, and having become mere membranes, are peeled off as being inert. The centre is also rejected as being mucilaginous, and almost inert. The middle scales are thick, fleshy, and attenuated at the edges, and are each covered with a very dense cuticle of fine shaded pink, like some conch shells. This cuticle impedes the exhalation of the moisture if the scales be merely separated, and therefore the transverse sections of the bulb are made, that the vessels may be divided. The heat applied must be very moderate at first; otherwise, from the great quantity of water the bulb contains, and the nature of its parenchyme, the latter is extremely apt to undergo a species of coction, if too great heat has been employed in drying it. They must remain long in the stove till they are perfectly dry. The bulb loses in this process four-fifths of its original weight, or 1000 yield 180; the parts which exhale with a moderate heat appear to be merely watery: hence six grains of the dry root are equivalent to half a drachm of it when fresh.

Med. use.—Dried squills furnish us with a medicine, sometimes advantageously employed as an emetic, often as an expectorant, and still more frequently as a powerful diuretic.

PULVIS SPONGIÆ USTÆ. *Dub.* SPONGIA USTA. *Lond.*
Powder of Burnt Sponge.

Cut the sponge in pieces, and bruise it, so as to free it from small stones (foreign matters adhering to it, *Lond.)*; burn it in a covered iron vessel, until it become black and friable; afterwards reduce it to a very fine powder.

By burning, sponge is partially decomposed. It loses its water, and the animal principles of which it chiefly consists are decomposed; but the charcoal and saline matters, especially the hydriodates, on which its virtues depend, remain in a state fitter for medical use. The burning or roasting should not be carried farther than what is sufficient to decompose the animal principles, and render the sponge friable. 1000 parts yield 333 of burnt sponge. It is known to be good when violet fumes arise from the action upon it of sulphuric acid assisted by heat.

CHAP. XVII.

EXPRESSED AND INSPISSATED JUICES *.

The juices of succulent plants are of a very compound nature, consisting of the sap, the secreted fluids, and fecula, mixed together. The fluids expressed from succulent fruits, whether acid or sweet, from most of the acrid herbs, as scurvy-grass, and water-cresses, from the acid herbs, as sorrel and wood-sorrel, from the latescent plants, as dandelion and hawkweed, and from various other vegetables, contain great part of the peculiar taste and virtues of the respective subjects. The juices, on the other hand, expressed from most of the aromatic herbs, have scarcely any thing of the flavour of the plants. Many of the odoriferous flowers, as the lily, violet, and hyacinth, not only impart nothing of their fragrance to their expressed juice, but have it totally destroyed by the previous bruising.

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* M. Chereau uses *Opoliques* to designate the order of expressed juices, and *Opolé* for the kinds when officinal, and *Opolite* when magistral.

M. Recluz has written a very elaborate and instructive paper on vegetable juices, as an object of pharmacy. He classifies them into, 1*st*, *Acid*, as those of the lemon, barberry, cherry, loveapple, quince, gooseberry, pear, apple, sorrel, wood-sorrel, verjuice, &c. 2*d*, *Alcaloid*, belladonna, hemlock, henbane, tobacco, poppy, thornapple, *solanum nigrum*. 3*d*, *Saline*, pellitory, houseleek. 4*th*, *Bitter ;* (a) *tonic*, lesser centaury, blessed thistle, succory, fumitory, marsh-trefoil, dandelion, scabious, soapwort, &c.; (b) *cathartic*, bryony, dwarf elder, buckthorn, *globularia*, *convolvulus turpethum*. 5*th*, *Astringent*, toxicodendron, *cytinus hypocistus*, &c. 6*th*, *Aromatic ;* (a) *simple*, chervil, parsley, fennel, the *labiatæ*, *corymbiferæ*, &c.; (b) *acrid*, garlic, scurvy-grass, cresses, *erysimum*, horse-radish, &c. 7*th*, *Resinous*, elaterium, hedge-hyssop, &c. 8*th*, *Saccharine*, beet, sugar-cane, mapple, maize, sorgho, grape, &c.

In gathering the vegetable substances from which juices are to be extracted, attention must be paid to a variety of circumstances, as their natural climate, the soil and exposure, natural season, the different periods of their growth, their wild or cultivated state, and the use for which they are intended.

Their previous preparation respects their being freed from foreign substances, washing, drying, decortication, *egrapage*, or pulling berries from the stalks, and division, by pulping, trituration, rasping.

The mode of obtaining them are, maceration, coction, fermentation, expression.

When first obtained, they are coloured, turbid, and loaded with parenchymatous matter. They require to be purified either by mechanical means, as rest, and filtration, or by chemical means, as evaporation, albumen and heat, or fermentation. Rest may be employed with juices which are very fluid, do not contain volatile matter, and are not susceptible of alteration, and with subacid juices, as that of lemon. By rest these undergo a kind of slight fermentation, and all their mucilaginous and other viscid parts separate.

Filtration is perhaps the most perfect means of defecation, but it is tedious, and applicable only to very fluid juices. In many instances it may be facilitated by the addition of water. The action of heat is more expeditious, and is employed for juices which are very alterable. It is performed by introducing the juice into a matrass, and immersing it in boiling water for some minutes. The albumen and fecula are coagulated, and easily separated by filtration. Clarification by white of egg is only used for very viscid mucilaginous juices, which contain nothing volatile. The white of two eggs may be allowed to each pint of juice. They are beat to a fine froth, the juice gradually mixed with them, and the whole brought to ebullition. The albumen coagulating envelops all the parenchymatous and feculent matters, and the juice now passes the filter readily. By this process, juices are rendered sufficiently pure; but the heat employed deepens their colour, and manifestly alters them, so that it is not merely a defecating but a decomposing process. When depurated, juices are yellow or red, but never green.

M. Recluz has also drawn up a very instructive table of the quantity, from one pound French, density in Baumé's areometer after filtration, colour, and taste of the expressed juices of many vegetables, extracted from different parts, and gathered in different seasons, for the purpose of comparison.

ROOTS.

Name.	*Part and Season.*	*Quantity.*	*Dens.*	*Colour.*	*Taste.*
Allium sativum	bulb	4 oz.	5°	amber	acrid and pu
Arctium Lappa	July	8 oz.	4°	brownish yel.	bitterish and
Beta vulgaris	Nov.	9 oz.	10°	clear brown	very saccharin
Cochlearia Armorac.	getting leaves	7 oz.	3°	do.	acrid and pu
Do.	at inflorescence	6 oz.	4°	do.	stronger
Daucus Carota	June	11.5 oz.	5.5°	yellowish	sacch. and ar
Do.	Sept. and Dec.	10.5 oz.	6°	do.	less sacch. an aromatic
Rumex patientia	July	3 oz.	4°	brownish yel.	very bitter &
Pastinaca sativa	June	10.5 oz.	5°	yellowish	sacch. and ar

LEAVES, HERBS AND FLOWERS.

Name.	*Part and Season.*	*Quantity.*	*Dens.*	*Colour.*	*Taste.*
Apium Petrosel.	leaves at infl. in Nov.	10 oz. 4 dr.	4.5°	yellowish	slightly salin very aroma
Atropa belladonna	leaves at fructif.	10 oz. 2 dr.	5°	brownish	slightly salin
Borago officin.	plant before inflor.	9 oz. 4 dr.	3.5°	reddish	fresh and sali
Do.	do. at inflorescence	8 oz.	4.5°	brownish red	saline and na
Do.	do. at fructification	6 oz. 4 dr.	1.5°	darker	stronger
Do.	primordial leaves	12 oz.	2°	reddish	insipid and na
Do.	radical l. before infl.	12 oz.	2.25°	a little darker	insip. sal. and
Do.	do. at inflor.	10 oz. 4 dr.	2.5°	red. brown	saline, extract
Do.	stalks in flower	8 oz. 2 dr.	2.5°	brownish red	saline and bit

LEAVES, HERBS, AND FLOWERS,—*Continued.*

Names.	*Part and Season.*	*Quantity.*	*Dens.*	*Colour.*	*Taste.*
go officin.	stalks in fruit	7 oz. 6 dr.	3°	red brown	more intense
Do.	caulin. l. before infl.	9 oz. 3 dr.	2.75°	do.	saline and bitterish
Do.	do. at inflor.	10 oz. 4 dr.	3.25°	darker	do.
Do.	branch l. before infl.	6 oz. 1 dr.	2.75°	brownish red	saline and nauseous
Do.	do. at inflor.	7 oz.	3.25°	red brown	stronger
Do.	stalks and branch leaves at fruc.	9 oz. 4. dr.	3.5°	do.	do.
Do.	summits July	10 oz. 3 dr.	3°	do.	very salt & bitterish
Do.	do. Nov.	8 oz. 4 dr.	2.75°	do.	do. with after taste of extract.
sica oleracea pitata rubra	caulinary leaves, a little before infl.	8 to 9 oz.	5°	violet red	sweetish and slightly aromatic
rophyll. sativ.	leaves at infl.	10 oz. in Sept. 14 oz. in June	3°	brownish red	slightly saline, arom.
orium Intybus	leaves at infl.	6 oz. 4. dr.	3°	do.	bitter
Do.	do. after infl.	10 to 12 oz.	4°	red brown	very bitter
um maculatum	leaves at infl.	10 oz.	5°	brownish red	slightly saline & nau.
learia officin.	leaves at infl.	9 oz. 6 dr.	3°	light brown	acrid, exciting cough.
ra Stramon.	leaves at infl.	12 oz.	4°	red brown	slightly saline & nau.
Do.	do. at fructif.	10 oz.	5°	do.	more so.
aria officin.	plant in flower	6 to 8.5 oz.	4.5°	brownish yel	bitter, acrid & nau.
oma hederac.	l. at infl. in Mar.	10 oz.	4°	brownish red	bitterish
Do.	do. at infl. in July	9.5 oz.	5°	deeper	do.
sciamus niger	do. at infl.	8. oz.	4°	brownish	slightly saline and disagreeable
Do.	do. at fructif.	9 oz. 1 dr.	5°	do.	saline and nauseous
uca sativa	central l. blanched	12.5 oz.	2.5°	brownish yel.	slight saline, fresh
Do.	green outer leaves	11 oz.	2.75°	do.	do. and bitterish
Do.	stem	12.5 oz.	3.25°	clear red. yel.	very bitter
yanth. trif.	leaves at infl.	9 oz.	4°	red brown	very bitter with acrid after-taste
urialis ann.	leaves at infl.	8.5 to 9 oz.	4°	brownish red	a little saline, insip.
Do.	do. at fructif.	7 to 8 oz.	4.5°	red brown	do. and nauseous
rtium offic.	plant before infl.	12 oz.	2.5°	very light br.	saline, slightly acrid
Do.	do. at infl.	9 oz.	3°	do.	do.
tiana Tabacum	leaves at infl.	10 oz. 3 dr.	5.5°	do.	acrid and saline
ver somnif.	leaves at fructif.	12 oz.	5°	reddish br.	bitter, slight saline
taria offic.	leaves at fructif.	7.5 oz.	4°	do.	insipid & disagr.
ca vulgaris	flowers	7 oz.	4°	red brown	bitter and aromatic
laca oleracea	leaves at infl.	9 oz.	2.25°	colourless	fresh & slightly astr.
Do.	stem do.	12 oz.	2.25°	rosy	more decided
rium Sanguis.	leaves at infl.	6.5 oz.	4°	reddish yel.	sweet & slightly astr.
centifolia	petals	4 oz.	4°	yel. red.	slight, rough, arom.
ex acetosa	radical leaves	11 to 12.5 oz.	3°	rosy	very acid
arum offic.	stalks	6 to 8 oz.	5° to 14°	clear brown rather dark	very saccharine
naria offic.	leaves at infl.	10 oz. 6 dr.	4°	golden yel.	bitter and very acrid
Do.	flowers	6 oz. 2.5 dr.	6°	darker	do.
osa arvensis	radical leaves, July	9.5 oz.	4°	red. brown	bitter, rough & acrid
erviv. Tector.	radical leaves	12.5 oz.	4°	colourless	acid
um nigrum	leaves at infl.	9.5 oz.	4.3°	brownish red	slightly saline & nau.
Do.	do. at fructif.	11 oz. 3 dr.	5°	red brown	saline and nauseous
x. dens leonis	leaves at infl.	8 to 9 oz.	3.5°	brownish red	very bitter
a (urens ?)	plant in flower	9 oz.	4°	do.	sweetish & nauseous
rens (dioica ?)	do.	9.5 oz.	5°	deeper	do. and of extract
Do.	leaves in fruct.	5.5 oz.	5°	yel. brown	sweetish & nauseous
Do.	stem in fructif.	8 oz.	4°	clear do.	sweetish
tricolor arv.	plant at infl.	6 oz.	5°	brownish red	acrid and nauseous
Mais	stem after fecund.	8oz.	7.5°	clear brown	very saccharine

FRUITS.

Name.	*Part and Season.*	*Quantity.*	*Dens.*	*Colour.*	*Taste.*
Beberis vulgaris	berry	8 oz. 2 drs.	9°	yel. red	very acid
Cerasus Caproniana	sarcocarp	11.5 oz.	7°	clear red	acid
Cerasus Juliana	do.	8 to 10 oz.	7°	deep red	saccharine aro
Citrus Bergamica	pulp	10 oz. 3 dr.	7°	colourless	saccharine insi
Citrus Aurantium	pulp	8 oz.	5.25°	slight orange	sacch. slight. a
Citrus medica	pulp	10.5 to 11 oz.	5.25°	colourless	very acid
Do.	pulp over ripe	12 oz.	4°	citrine	less acid
Cucumis Melo	flesh	13 oz.	3°	reddish yel.	sacch. and aro
Cucumis sativus	sarcocarp	10 to 10.5 oz.	3°	colourless	fresh, insipid
Cydonia vulgaris	fruit	10 to 12.5 oz.	8°	colourless	slightly acid, s and aromati
Fragaria vesca	fruit without calyx	6 to 7 oz.	6°	clear red	acidulous, sacc and arom.
Morus nigra	sour fruit	12 oz.	7°	clear red	very acid
Do.	fruit ripe and black	9 to 10 oz.	10°	purple red	sacch. mucilag
Physalis Alkekengi	berry	9 oz. 5 dr.	7°	orange	bitter and acid
Punica Granatum	pulp	7 to 8.5 oz.	6°	clear red	acid and aroma
Pyrus communis	Messire Jean, Sept.	11.5 oz.	6°	amber	sweet and acid
Do.	Mouil. bouche, Sept.	12 oz. 5 dr.	6.5°	do.	sweet, sli. acid,
Pyrus malus	pommes d'Aout	11.5 oz.	6°	colourless	acid
Do.	do. Colville Sept.	10 oz. 6 dr.	6.5°	light amber	sweet and arom
Do.	do. reinette	10 oz. 5 dr.	7°	do.	do.
Rhamn. cathartic.	fruit picked	9 oz.	10° to	purple red	very bitter
Do.	do.	9.5 to 11 oz.	11° 12°	violet red	intensely bitter
Ribes rubrum	berries picked	11 oz.	6°	fine red	very acid and
Ribes album	do.	9.5 to 10 oz.	6°	amber	less acid, sac.
Rubus Idæus	do.	13 to 14 oz.	5°	violet red	do.
Rubus fruticosus	not quite ripe	12 oz.	6° to 7°	gooseb. red	acid and aroma
Sambucus Ebulus	do.	11 oz.	6°	scarlet	bitter and naus
do.	not quite ripe	12 oz.	7°	deeper	more bit. and
Sambucus nigra	berries picked	10 oz. 6.5 dr.	4.75°	gooseb. red	sweet and insip
Vitis vinifera	Lambrusque picked	7 to 8 oz.	7° to 8°	colourless	very acid
Do.	Chasselas de Fontainbleau	12.5 oz.	10°	do.	sweet and sacch
Do.	white Muscat	12 oz. 2 dr.	16°	citrine	sacch. and aro
Do.	Munier de Clamart.	13 oz.	10°	rosy	sweet, and sl.

There are great differences in regard to their preserving those virtues, independently of the volatility of the active matter, or its disposition to exhale. The methods employed are, 1st, oil; 2d, alcohol; 3d, sulphurous acid, and sulphite of lime; 4th, that of M. Appert.

The most common and ancient method is by covering them in flasks with a layer of almond or poppy oil. But this is insufficient to interrupt the action of the air; for from the very first, fermentation takes place, bubbles of gas may be seen rising from the bottom of the flasks and forming a scum on the surface, while a deposit more or less coloured takes place. Even at the end of a year, this change is going on, though more slowly. M. Recluz also observed in the juices of acid fruits the formation of gelatinous masses, which, on being taken out and exposed on plates, soon dissolved into a liquid having the taste of the juice, but weaker.

Salts with a base of lime, and the peculiar acid of the vegetable, are also deposited.

Alcohol causes the precipitation of the albumen from those juices which contain it, as buckthorn, elder, dwarf elder, alkekengi. It is an excellent preservative even when the flasks are merely covered with paper; but it is not applicable, except for juices intended to be converted into *liqueurs.*

Juices put into bottles which have been previously filled with sulphurous acid gas, are slightly discoloured, and when converted into syrups, retain a little of its unpleasant flavour. Sulphite of lime has not these inconveniences, and M. Recluz says, that from 10 to 15 grains are sufficient to preserve perfectly a pint of any acid juice for several years.

The last method is that invented by M. Appert. It is the most perfect, but its manipulation is difficult to the inexperienced. Its principles are, 1st, to choose well the bottles and corks; 2d, to fill the bottles up to the origin of the neck; 3d, to cork them dextrously, and wire the corks down; 4th, to place them up to the neck in a boiler filled with cold water, and guarded with straw, and heat them gradually to ebullition, then to extinguish the fire, and allow them to become lukewarm; 5th, to cover the corks and necks of those bottles which are perfect with a lute of recent quicklime and fat cheese; 6th, to place them in the cellar upon sand. During this process the juices become turbid, and after some time let fall a deposit. This arises from the combination of the air in the neck of the bottle with the albumen of the juice, or fermenting principle, after which there is no further change.

In common practice, to the depurated juice, which is then left at rest, about one-fortieth part of their weight of good spirit of wine may be added: a fresh sediment will now be deposited, from which the liquor is to be poured off, or filtered, and put into small bottles which have been washed with spirit and dried. A little oil is to be poured on the surface, so as very nearly to fill the bottles, and the mouths closed with leather, paper, or stopped with straw, as the flasks are in which Florence oil is brought to us: this serves to keep out dust, and suffers the air to escape, which, in process of time, arises from all vegetable liquors, and which would otherwise endanger the bursting of the flasks; or, being imbibed afresh, render their contents vapid and foul. The bottles are to be kept on the bottom of a good cellar or vault, placed up to the necks in sand. By this method some juices may be preserved for a year or two; and others for a much longer time, though whatever care be taken, they are found to answer better when fresh; and from the difficulty of preserving them, they have been very much laid aside, especially since we have been provided with more convenient and useful forms of remedies.

Med. use.—Expressed juices are no longer officinal in Britain, but may be ordered extemporaneously. They may be taken in doses from an ounce or two to a quarter of a pint, two or three times a-day: they generally increase the urinary secretion, and sometimes induce a laxative habit.

SUCCI SPISSATI. *Ed.*

Inspissated Juices [*].

Bruise the fresh substance, and, including it in a hempen bag, compress it strongly till it yield its juice, which is to be evaporated in shallow vessels heated in boiling water, saturated with muriate of soda, and immediately reduced to the consistence of thick honey.

After the mass has become cold, it is to be put up in glazed earthen vessels, and moistened with alcohol.

Dub.

Leaves intended for the preparation of inspissated juices should be collected during their inflorescence, when the flowers begin to appear. They are better inspissated if the superfluous moisture be evaporated by a medium heat in a vapour bath, and if they be continually stirred with a spathula towards the end of the process.

SUCCUS SPISSATUS ACONITI. *Dub.*

Inspissated Juice of Monkshood.

Take of monkshood leaves, one pound. Bruise the leaves moistened with water, in a mortar. Then express the juices without defecation, to a due thickness, in the manner directed above.

EXTRACTUM ACONITI. *Lond.*

Extract of Monkshood.

Take of Monkshood leaves, fresh, one pound.

Bruise them in a stone mortar, sprinkling a little water upon them: then express the juice, and evaporate it without separating the sediment, to a proper thickness.

IN this manner are prepared, the

SUCCUS SPISSATUS. *Ed. Dub.* EXTRACTUM. *Lond.*

ACONITI NAPELLI. *Ed.* ACONITI. *Lond. Dub.* from the leaves.

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[*] *Syn.* Inspissated juices, in the nomenclature of M. Chereau, are *Opostolés*; but the same term is employed for Extracts.

ATROPÆ BELLADONNÆ. *Ed.* BELLADONNÆ. *Lond. Dub.* from the leaves.

CONII MACULATI. *Ed.* CONII. *Lond. Dub.* from the leaves.

HYOSCIAMI NIGRI. *Ed.* HYOSCIAMI. *Lond. Dub.* from the herb.

LACTUCÆ SATIVÆ. *Ed.* from the plant.

LACTUCÆ VIROSÆ. *Ed.* from the plant.

SAMBUCI. *Dub.* from the fresh ripe berries.

SUCCUS SPISSATUS SAMBUCI NIGRI. *Ed.*

Inspissated Juice of Elder Berries.

Take of Juice of ripe elder berries, five parts;
Refined sugar, one part.

Evaporate with a gentle heat, to the consistence of pretty thick honey.

THE inspissated juice is a very convenient form for the exhibition of those substances which are sufficiently succulent to afford a juice by expression, and whose virtues do not reside in any very volatile principle. By inspissation, the bulk of the requisite dose is very much diminished; they are reduced to a form convenient for making up into pills; and they are much less apt to spoil than the simple expressed juices. When well prepared they contain the virtues of the respective vegetables in a very concentrated state. Those of the elder, black currant, and lemon, are acidulous, cooling, and laxative, and may be used in considerable quantities, while those of the wolfsbane, hemlock, deadly nightshade, henbane, and poisonous lettuce, when properly prepared, are highly narcotic and deleterious, and must be given only in very small doses. The nature of the soil, the season, and many other circumstances, however, materially alter the quantity and nature of the product. The mode of their preparation is not yet reduced to fixed principles. Some pharmaceutists direct the juices to be inspissated as soon as they are expressed; others allow them previously to undergo a slight degree of fermentation; some, as the British Colleges, inspissate the entire juices; while others previously defecate them before they proceed to inspissate them. What the effect of this fecula is upon the virtues, consistency, or durability, of the inspissated juices, is not well ascertained. In some foreign Pharmacopœias, we find two inspissated juices of the same article, one *cum fæcula*, and another *sine fæcula.*

The degree of heat, to which vegetable juices should be subjected during their inspissation, is also still unsettled. Almost all of them contain an albuminous matter, which is coagulated, or at least considerably changed by a boiling heat.

It does not appear that this in any way contributes to the virtues of the juice, but that if left in its natural state it acts as a ferment, and gives them a great tendency to decomposition. In this case, whether we intended to separate it or not, it would be advisable to heat the expressed juice, until the albuminous principle was coagulated, before we proceeded to the final inspissation. After this, the lower the temperature at which the inspissation is completed the better, provided it be done sufficiently quickly to prevent all fermentation.

Mr Barry of Plough Court, London, has published, in the 10th volume of the Medico-Chirurgical Transactions, a very ingenious method of evaporating vegetable juices and solutions *in vacuo* at a low temperature, by which all risk of rendering them empyreumatic is avoided, and their volatile principles are much better preserved.

Almost all the inspissated juices of vegetables attract humidity strongly from the air, and become soft, and even liquid, in no long time. This is caused by the deliquescence of salts, commonly very soluble, with which the juices are saturated, and which, being deprived of their water by the inspissation, regain it from the atmosphere.

The extracts, however, of the narcotic vegetables, to which their chlorophylle is restored, become, in the course of some years, very solid; and this exsiccation favours singularly, the attraction of the saline molecules which they contain, and accordingly in this state they are found in crystals more or less regular, as muriate of soda, oxalate of lime, nitrate, sulphate, oxalate, and muriate of potass, &c.

M. Recluz has also drawn up a table of the quantity of inspissated juice of pilular consistence, got from 16 oz. Troy of various vegetables, together with the change observed in its state at the end of twelve months.

Plant.	*Part.*	*Product.*	*Finally.*
Atropa Belladonna,	Leaves	1 oz. 3 dr.	Very soft.
Borago officinalis,	Herb	4 to 6 dr.	do.
Cichorium Intybus,	do.	4 dr.	Soft.
Conium maculatum,	do.	1 oz. 30 gr.	Pilular.
Datura Stramonium,	Leaves	4 dr.	Very soft.
Daucus Carota,	Root	5 dr. 30 gr.	do.
Fumaria officinalis,	Herb	6 dr.	Soft.
Hyosciamus niger,	do.	3 to 6 dr.	do.
Momord. Elaterium,	Fruit	5 dr.	Pilular.
Prunus Cerasus,	do.	1 oz. 4 dr.	Soft.
——— Mahaleb,	do.	1 oz. 7 dr.	Ordinary
Rhamnus cathart.	do.	2 oz.	Permanent.
Ribes rubrum,	do.	1 oz. 4 dr.	Soft.
Sambucus nigra,	do.	2 oz.	Permanent.
Sisymbrium Nasturtium,	Herb	4 dr.	Soft.
Vitis vinifera alba,	Fruit	1 oz. 6 dr.	Rather soft.

The chlorophylle was added to the inspissated juice of the hemlock, and the elaterium is probably from the defæcated juice.

ELATERIUM. *Dub.*
Elaterium.

Slice ripe wild cucumbers over a basin, express the juice very gently, and strain it through a very fine hair sieve, into a glass vessel. Then set it aside for some hours until the thicker part subside. Reject the supernatant liquor, and dry with a moderate heat the fecula, laid upon and covered with a linen cloth.

EXTRACTUM ELATERII. *Lond.*
Extract of Elaterium.

Slice ripe wild cucumbers, express the juice very gently, and filter it through a very fine hair-sieve, into a glass vessel; then let it rest for some hours, until the thicker part subside. Throw away the thinner supernatant fluid, and dry the thicker part with a gentle heat.

THIS is not properly an inspissated juice, but a deposition from the expressed juice. Such depositions have long been called *Feculæ*, whether they be mild and nutritious, *Fæcula alibilis* of the French, such as starch; or drastic, *Fæcula medicinalis* of the French, such as the substance of which we are now treating.

Common filtration through paper does not succeed in this case; the deposition forming a glutinous varnish upon the paper, through which the liquid cannot pass. The separation is to be effected by drawing off the fluid from the top, by capillary filtration, and finishing it by compression between folds of linen.

The French elaterium is a totally different substance from the English elaterium; the latter being the fecula, from which the fluid part of the juice has been removed, in the nomenclature of M. Chereau the *Amidolé*, and the former the inspissated fluid juice, without the fecula, or the *Opostolé* of M. Chereau.

PULPARUM EXTRACTIO. *Ed.*
Extraction of Pulps *.

Boil unripe pulpy fruits, and ripe ones, if they be dry, in a small quantity of water, until they become soft; then press out the pulp through a hair-sieve, and afterwards boil it down to the consistence of honey, in an earthen vessel, over a gentle fire, taking care to stir the matter continually, to keep it from burning.

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* *Syn.* M. Chereau has given the name of *Pulpolites* to pulps, to designate their being extemporaneous preparations.

The pulp of *Cassia fistularis* is, in like manner, to be boiled out from the bruised pod, and reduced afterwards to a proper consistence, by evaporating the water.

The pulps of fruits that are both ripe and fresh are to be expressed through the sieve, without any previous boiling.

Dub.

Fruits, whose pulps are to be extracted, if they be unripe, or ripe and dry, are to be boiled in a little water until they become soft. Then the pulps, expressed through a hair-sieve, are to be evaporated to a proper degree of thickness.

Lond.

Set *pulpy fruits*, if they be unripe, or if ripe and dry, in a moist place, until they become soft; then press the pulps through a hair-sieve: afterwards boil them with a gentle heat, and stir them frequently; and, lastly, evaporate the water in a water-bath, until the pulps acquire the proper consistency.

Pour boiling water on the bruised pods of the *Cassia*, so as to wash out the pulp; which is then to be pressed, first through a coarse sieve, and afterwards through a hair-sieve; lastly, evaporate the water in a water-bath, so as to reduce the pulp to a proper consistency.

Express the pulp, or juice of ripe and recent fruits, through a sieve, without boiling them.

THERE are very few pulps now used to which these directions are applicable. Heps, prunes, tamarinds, figs and *Cassia fistularis* are all that are employed in any pharmaceutical composition. Of these the hep is always used fresh, the tamarind is always sufficiently soft, and the cassia pods and figs dry, and the prunes soft or dry.

When it is necessary to soften them, the decoction, or stewing ordered by the Edinburgh and Dublin Colleges is in every respect preferable to exposing them to a moist air, which is not only often inefficacious, but is apt to render them mouldy. On the other hand, the precaution used by the London College, of finishing the evaporation in a water-bath, is highly proper, as otherwise they are extremely apt to become empyreumatic.

Off. Prep.—Conserva rosæ caninæ, *L. E.* Electuarium cassiæ fistulæ, *E. L. D.* Electuarium cassiæ sennæ, *E. L. D.*

CHAP. XVIII.—FIXED OILS [*].

THESE oils are commonly denominated Expressed Oils, an appellation which is manifestly improper; as, in some instances, they are obtained without expression, and, in others, expression is employed to obtain volatile oils. The Edinburgh College have therefore distinguished these different classes of oils by the terms Fixed and Volatile, which accurately characterise them.

Fixed oil exists both in the animal and vegetable kingdom. At present the latter only is treated of. Vegetable fixed oil is procured in quantity sufficient for medical and economical purposes only from fruits. It is found in a single root, that of the *Cyperus esculentus.* It also occurs sparingly as a product when analysing vegetable substances. Sometimes, although very rarely, it is contained in the parenchyme of the fruit. Of this the best known example is the olive. But it is most commonly found in the seeds of dicotyledonous vegetables, sometimes also in the fruit of monocotyledonous plants, as the *cocos butyracea.* Fixed oils have various degrees of consistency, from the tallow of the *croton sebiferum* of China, and the butter of the butter-tree of Africa, to the fluidity of olive oil; but in general they are transparent, more or less coloured, somewhat viscid, inodorous fluids, having a mild taste and unctuous feel. In the different species the specific gravity varies from 0.9403 to 0.9153. The point of congelation is various. Commonly the same natural oil contains two principles, one of which is solid at a moderate temperature, *Stearine,* and the other remains fluid even at the lowest, *Elaine.* Olive oil begins to concrete a little above the freezing temperature of water, while linseed oil is not frozen at —5° Fahr. In close vessels oils may be long preserved without change; but by exposure to the atmosphere they are soon altered. They unite readily with oxygen, which renders them concrescible. When they become rancid, they undergo a further degree of decomposition, and are found to contain an acid. Their boiling point exceeds 600°; and by being converted into vapour, they become empyreumatic. The products of their distillation are curious, and have lately been minutely examined, and among them are the margaric and oleic acids, or the same acids which are produced during their saponification. Oil in the state of vapour is inflammable, and burns with a white flame. When the combustion is complete, the products are carbonic acid gas and water, but in general soot is also deposited. They are totally insoluble in water, have various habitudes in regard to alcohol, and are readily dissolved by ether. They may be blended with sugar and gum by trituration, as in emulsions, and they dissolve the volatile oils, resins, and gummy resins. With the alkalies and earths they form soaps, and with metallic oxides plasters. The sulphuric acid renders the fixed oils brown and thick, and converts them into water and charcoal. The nitric acid oxygenizes them. The oxygenized muriatic acid or chlorine blanches them, and renders them concrete, like tallow or wax. The oils oxidize several of the metals, and are oxidized by several of their oxides. Fixed oils do not seem capable of combining with charcoal, but are freed from impurities by being filtered through hot charcoal. When assisted by heat, they dissolve sulphur and phosphorus.

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[*] *Syn.* Olea expressa, Olea unguinosa. M. Chereau uses *Oléoliques* for the name of the order of oily medicines, *Oleol* for the generic name of fixed oils, and *Oléolés* for medicinal oils.

Berzelius divides the fixed oils into three classes, the drying, the not drying, (greasy,) and the solid; but in the last he includes wax. The chief drying oils are those of the *Linum usitatissimum, Juglans regia, Cannabis sativa, Papaver somniferus, Ricinus communis,* and *Croton Tiglium.* The chief greasy oils are got from *Amygdalus communis, Olea Europæa,* various species of *Brassica* and *Sinapis.* The chief fixed oils are those of the *Theobroma Cacoa, Cocos butyracea, Vateria Indica, Myristica officinalis,* and *Laurus nobilis.*

Fixed oil is obtained from the fruits and seeds which contain it, either by expression or decoction.

When obtained by expression, oils often contain a mixture of mucilage, starch, and colouring matter; but part of these are gradually deposited. Heat, by rendering the oil more limpid, increases very much the quantity obtained by expression; but it renders it less bland, and more apt to become rancid, therefore heat is not used in the preparation of oils which are to be employed in medicine.

Decoction is principally used for the extraction of the viscid and consistent oils, which are melted out by the heat of the boiling water, and rise to its surface.

OLEUM AMYGDALÆ COMMUNIS. *Ed.*
Oil of Almonds.

After having bruised fresh almonds in a stone mortar, put them into a hempen bag, and express the oil, without heat.

In the same manner express from the same seeds, *Linseed oil.*

OLEUM LINI USITATISSIMI. *Ed.*

OLEUM AMYGDALARUM. *Dub.*

Oil of Almonds.

Rub fresh almonds in a mortar, and express the oil in a press, without heat.

Oil of Linseed is expressed in the same way from the seeds.

OLEUM LINI. *Dub.*

OLEUM AMYGDALARUM. *Lond.*

Oil of Almonds.

Macerate almonds, either sweet or bitter, in cold water, for twelve hours, and bruise them. Then express the oil, without heat.

OLEUM LINI. *Lond.*

Oil of Linseed.

Bruise the seeds of common flax, and express the oil, without heat.

OLEUM RICINI. *Lond.*

Castor Oil.

Bruise the peeled seeds, and express the oil without heat.

THOSE who prepare large quantities of the oil of almonds blanch them, by steeping them in very hot water, which causes their epidermis to swell and separate easily. After peeling them they dry them in a stove, then grind them in a mill like a coffee-mill, and, lastly, express the oil from the paste, inclosed in a hempen bag. By blanching the almonds, the paste which remains within the bag is sold with greater advantage to the perfumers, and the oil obtained is perfectly colourless. But the heat employed disposes the oil to become rancid, while the slight colour the oil acquires from the epidermis does not injure its qualities. For pharmaceutical use, therefore, the almonds should not be blanched, but merely rubbed in a piece of coarse linen, to separate as much as possible the brown powder adhering to the epidermis. Sixteen ounces of almonds commonly give five ounces and a half of oil. It is indifferent whether sweet or bitter almonds are employed, as the bitterness of the latter is not imparted to the expressed oil unless heat be employed.

Med. use.—The fixed oils are taken internally, either as topical lubricants to protect the parts to which they are directly applied from acrid substances to which they are exposed, or in large quantity to cause vomiting, especially when acrid poisons have been swallowed, or to cause purging. In this respect their activity differs exceedingly, a drop of croton oil acting as powerfully as half an ounce of castor oil, or six ounces of olive oil.

Externally the fixed oils are used as lubricants, and covering the surface with olive oil has been said to be a preventive of the contagion of the plague; but this cannot be admitted, when we consider that the lungs are the chief organs of absorption. They are more commonly applied in combination with other substances in the form of liniments, ointments, and plasters.

When oils become rancid, they are no longer fit for internal use, but are then believed to effect the killing of quicksilver, as it is called, more quickly.

CHAP. XIX.—OILY PREPARATIONS.

LINIMENTUM AMMONIÆ FORTIUS. *Lond.*

Stronger Liniment of Ammonia [*].

Take of Water of ammonia, one fluidounce;
Olive oil, two fluidounces.
Shake them together until they mix.

OLEUM AMMONIATUM. *Ed.*

Ammoniated Oil.

Take of Olive oil, eight parts;
Water of ammonia, one part.
Mix them together.

LINIMENTUM AMMONIÆ. *Dub.*

Liniment of Ammonia.

Take of Water of caustic ammonia, two fluiddrachms;
Olive oil, two fluidounces by measure.
Mix them by shaking them together.

LINIMENTUM AMMONIÆ SUBCARBONATIS. *Lond.*

Liniment of Subcarbonate of Ammonia.

Take of Solution of subcarbonate of ammonia, one fluidounce;
Olive oil, three fluidounces.

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[*] *Syn.* Linimentum ammoniatum, Sapo ammoniæ, Linim. volatile, Sapo ammoniacalis, Lin. ammonicum, Oleolite ammoniacale.

Shake them together till they are mixed.

These are ammoniacal soaps. The three first are chemically correct, and differ only in strength, the first containing more ammonia than the others. The last is a very injudicious preparation. If the subcarbonate be employed with the view of rendering the preparation less stimulating, the same end is more scientifically obtained, by increasing the proportion of oil mixed with pure ammonia, as the subcarbonate does not unite chemically with oil.

Med. use.—They are frequently used externally as stimulants and rubefacients. In inflammatory sore throats, a piece of flannel moistened with these soaps, applied to the throat, and renewed every four or five hours, is a most efficacious remedy. When too strong, or too liberally applied, they sometimes occasion inflammation, and even excite blisters. Where the skin cannot bear their acrimony, a larger proportion of oil may be used.

But they are even sometimes used internally, made into a mixture with syrup and some aromatic water. A drachm or two taken in this manner, three or four times a-day, is a powerful remedy in some kinds of catarrh and sore throat.

OLEUM LINI CUM CALCE, sive LINIMENTUM AQUÆ CALCIS. *Ed.* *.

Liniment of Lime Water, or *Linseed Oil with Lime.*

Take of Linseed oil,
Lime-water, of each equal parts.
Mix them.

LINIMENTUM CALCIS. *Dub.*

Lime Liniment.

Take of Lime-water,
Olive oil, of each three fluidounces;
Shake them together till they mix.

This is also a soap, with great excess of oil, which separates on standing.

Med. use.—This liniment, commonly called Carron Oil, is extremely useful in cases of scalds or burns, being singularly efficacious in preventing, if applied in time, the inflammation subsequent to these; or even in removing it, after it has come on.

OLEUM CAMPHORATUM. *Ed.*

Camphorated Oil.

Take of Olive oil, eight parts;

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* *Syn.* Sapo calcareus, Linim. calcar. Linim. calcicum, Oléolite calcaire.

Camphor, one part.

Triturate them together till the camphor be dissolved.

Dub.

Take of Olive oil, one ounce;
Camphor, one drachm.

Triturate them together till the camphor be dissolved, then filter.

This is a simple solution of camphor in fixed oil, and is an excellent application to local pains, from whatever cause, and to glandular swellings.

OLEUM SULPHURATUM. *Ed.*

Sulphuretted Oil.

Take of Olive oil, eight parts;
Sublimed sulphur, one part.

Boil them together with a gentle fire in a large iron pot, stirring them continually till they unite.

Lond.

Take of Washed sulphur, two ounces;
Olive oil, a pint.

Gradually add the sulphur to the oil, heated in a very large iron vessel, and stir constantly with a spatula, till they have united.

This is the old Balsam of Sulphur, but the directions for preparing it are not sufficiently precise. It is intended that the oil should be partially decomposed or burnt, and the preparation is expected to be an extremely fœtid and acrid fluid, of great viscidity and of a dark reddish-brown colour. The oil must be therefore heated to the boiling point, when by reacting on the sulphur it emits very suffocating fumes. The pot must be sufficiently large, as the mixture swells and boils up very much; and as it is apt to catch fire, a lid should be at hand to extinguish it by covering up the pot. But by the aid of a gentle heat, oil is capable of dissolving a considerable proportion of sulphur without any decomposition, and if saturated, the sulphur will crystallize on cooling.

Med. use.—Balsam of sulphur was formerly strongly recommended in coughs, consumptions, and other disorders of the breast and lungs; but it is manifestly acrid and irritating, and should therefore be used with the utmost caution. It has frequently been found to injure the appetite, offend the stomach and viscera, parch the body, and occasion thirst and febrile heats. The dose is from ten to forty drops. It is employed externally for cleansing and healing foul running ulcers.

CHAP. XX.—VOLATILE OILS[*].

VOLATILE OIL occurs in all odoriferous plants, and is the cause of their smell by its constant exhalation. It is found in all parts of plants; in every part of some, as in thyme; in others it occurs sometimes in one part, sometimes in another, in the petals, seeds, leaves, root, bark, &c. Sometimes it is different in different parts of the same plant, as in the flower, leaves and rind of the fruit of the orange, or the leaf and its footstalk of the cinnamon. Although volatile oil is the odoriferous principle of vegetables, its quantity is not always in proportion to their degree of smell. Roses and chamomile flowers, whose strong and lasting smell promises abundance, are found to contain but a small quantity of oil; the violet and jessamine flower, which perfume the air with their odour, lose their smell upon the gentlest coction, and afford scarcely any oil on being distilled; while savin, whose disagreeable scent extends to no great distance, yields volatile oil in abundance.

There is another remarkable difference in volatile oils, the foundation of which is less obvious, that of the degree of their pungency and acrimony. These are by no means in proportion, as might be expected, to those of the subject they were drawn from. The oil of cinnamon, in its undiluted state, is almost caustic; whereas black pepper yields a comparatively bland oil. The pungency resides frequently in a fixed principle, and does not rise with the oil.

The same plant is not equally fit for yielding oil, when produced in different soils or seasons, or at different times of their growth. Some, as lavender and rue, yield more oil if gathered when the flowers begin to fall off than at any other time; others, as sage, afford the largest quantity when young, before they have sent forth any flowers; and others, as thyme, when the flowers have just appeared. All fragrant herbs yield a larger proportion of oil, when produced on dry soils, and in warm summers, than in opposite circumstances. On the other hand, some of the disagreeable strong-scented plants, as wormwood, are said to contain most oil in rainy seasons, and when growing in moist rich soils. Sometimes the oil is secreted into vesicles, which prevent it from escaping so completely, that the plant may be dried without the dissipation of the oil; at other times, especially in flowers, it is formed on the very surface, and instantly exhales.

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[*] *Syn.* M. Chereau employs *Oleolate* for the generic name of volatile oils.

Volatile oils are commonly of some shade of yellow; some are colourless, red, or brown; others green, and a very few blue. They have a more or less agreeable smell, a warm, acrid, stimulating taste, and when diluted aromatic. They are not greasy, but rough to the touch; most of them lighter, but some heavier than water, varying in sp. gr. from 847 to 1096. Their boiling point is commonly about 320° Fahr., and when distilled alone they are partly decomposed. They are very inflammable, burn with a large white smoky flame, and require much oxygen for their combustion. Their congealing point is very various. Some freeze at 32°, others only at much lower temperatures, and others remain solid in ordinary temperatures. In this respect, like the fixed oils, they seem to consist of two varieties; one more readily frozen, called *Stearopte*, and the other, more difficultly frozen, called *Elæopte*, which may be easily separated when the oil is frozen. Dropped upon paper they evaporate completely without leaving a greasy stain. When exposed in mass to the air, they absorb oxygen, and become deeper coloured, thicker, less odorous, and are at last converted into resin. They are to a certain extent soluble in water. They are soluble in alcohol, and nearly in proportion to the oxygen that enters into their composition. They are soluble in ether. They dissolve sulphur and phosphorus; especially when heated, the fixed oils, resins, camphor and animal fat, and the vegetable alkaloids. They are resinified by chlorine, and acted upon with great violence, and even inflamed by the concentrated acids. They do not combine with the alkalies until they be resinified. Their composition is various, consisting chiefly of carbon and hydrogen; some containing also nitrogen, and others oxygen. They have been classified into those containing and those without oxygen. To the latter order belong oil of turpentine, stearopte of rose oil, lemon oil; and to the former oil of lavender, anise, stearopte of anise, rose, rosemary, peppermint, cinnamon and cassia, and also camphor.

OLEA VOLATILIA. *Ed.*

Volatile Oils.

Only so much water is to be added to the substance, as will be sufficient to prevent it from being burnt when distilled. The distillation is to be performed after due maceration, and the oil is, lastly, to be separated from the water.

Besides, in preparing the distilled waters and oils, it is to be observed, that the goodness of the subject, its texture, the season of the year, and similar causes, must give rise to so many differences, that no certain or general rule can be given to suit accurately each example. Therefore many things are omitted, to be varied by the operator according to his judgment, and only the most general precepts are given.

Olea destillata. *Lond.*

Distilled Oils.

The seeds of anise and caraway, the flowers of chamomile and lavender, the berries of juniper and allspice, the tops of rosemary, and the fresh herbs of the other articles, are to be used for the production of their respective oils.

Each of these is to be put into an alembic, and covered with water, and the oil drawn off by distillation into a large refrigeratory.

The water which is distilled over with the oils of caraway, peppermint, mint, allspice, and pennyroyal, is to be kept for use.

Olea essentialia. *Dub.*

Essential Oils.

Macerate the subject previously in water; put it into an alembic, and then draw off into a receiver the liquor by means of the heat of a steam bath. Separate, by a proper apparatus, the oil which will either float on the surface of the water, or sink to the bottom according to their respective gravities.

In distilling fennel, and caraway seeds, peppermint, spearmint, pennyroyal, and pimento berries, the liquor which comes over along with the oil is to be preserved for use in the manner directed in the chapter on Distilled Waters.

According to these directions, prepare

Oleum volatile. *Ed.* O. distillatum. *Lond.* O. essentiale. *Dub.*	Volatile, distilled or essential, oil of
Anthemidis. *Lond.* A. nobilis. *Ed.*	Chamomile, *from the flowers.*
Carui. *Dub. Lond.*	Caraway, *from the seeds.*
Fœniculi dulcis. *Dub.*	Fennel, *from the seeds.*
Juniperi. *Lond. Dub.* J. communis. *Ed.*	Juniper, *from the berries.*
Sabinæ. J. sabinæ. *Ed. Dub.*	Savine, *from the leaves.*

LAURI SASSAFRAS. *Ed.*	Sassafras, *from the root, bark, and wood.*
LAVANDULÆ SPICÆ. *Ed.* ——— *Lond. Dub.*	Lavender, *from the flowering spikes.*
MENTHÆ PIPERITÆ. *Ed. Lond.* ——— PIPERITIDIS. *Dub.*	Peppermint, *from the recent herb in flower.*
——— VIRIDIS. *Lond. Dub.*	Spearmint, *from the recent herb in flower.*
MYRTI PIMENTÆ. *Ed.* PIMENTÆ. *Lond. Dub.*	Pimento, *from the fruit or berry.*
ORIGANI. *Lond. Dub.* O. MAJORANÆ. *Ed.*	Origanum, *from the recent herb in flower.*
PIMPINELLÆ ANISI. *Ed.* ANISI. *Lond. Dub.*	Aniseed, *from the seeds.*
PULEGII. *Lond. Dub.*	Pennyroyal, *from the recent herb in flower.*
RORISMARINI. *Dub.* R. OFFICINALIS. *Ed.* ROSMARINI. *Lond.*	Rosemary, *from the flowering tops.*
RUTÆ. *Dub.*	Rue, *from the herb in flower.*

Volatile oils are obtained from recent or dried vegetables. Some, as oil of orange flowers and roses, can be procured only from the petals, when recent or preserved with salt; while others are generally distilled from the vegetable dried. It is thought, that herbs and flowers, moderately dried, yield a greater proportion of volatile oil, than if distilled when fresh. Drying may be useful, either by diminishing the bulk of the subject to be distilled, or by causing it to part with its oil more easily; besides aromatic waters, distilled from the dry herb, are more fragrant than from the fresh. Large quantities of the oils of lavender, peppermint, spearmint, and pennyroyal, are annually distilled in this country from the fresh herb. The oils of aniseed, chamomile, caraway, juniper, origanum, rosemary and pimento, are usually imported.

Volatile oils in themselves are not so volatile as water. But many of them rise at 212° unchanged along with aqueous vapour; others are less volatile, and the water must be saturated with sea salt, to raise its temperature to 230°, before it will come over.

The subject of distillation, if dry, should be macerated in the water until it be perfectly penetrated by it. To promote this effect, woods should be thinly shaved, or sawn across the grain, roots cut transversely into thin slices, barks reduced into coarse powder, and seeds slightly bruised. Very compact and tenacious substances require the maceration to be continued for some time; for those of a softer and looser texture, a short time is sufficient: herbs and flowers stand in no need of maceration, and are even injured by it.

The proportion of water to be added varies considerably. More than enough diminishes the product of oil, or prevents its separation altogether, while a deficiency of water does not bring over the whole oil, and increases the risk of still-burning. Some substances never yield oil on the first distillation, and it is necessary to return the distilled water repeatedly upon fresh quantities of the subject in the still pot, and draw it off again and again, until it come over sufficiently impregnated to part with a proportion of the oil. This process is termed *Cohobation*, and by means of it the virtues even of inodorous plants are supposed to be extracted.

Product of Volatile Oil from 10,000 *parts of the substance, from the Pharmacopée Raisonnée.*

Names.	*Part.*	*Products.*	*Observations.*
Anthemis nobil.	recent flower	13—18	blue, green, citron
Apium Petrosel.	plant in flower	5—2	very green, butyraceous
Artemisia Absinth.	summits	19—31	very deep green
——— Santon.	dry flowers		
Anethum graveol.	dry seeds	310	very fluid, light lemon
——— Fœnic.	do.	250	almost colourless, cryst. at 42°
Carum Carui,	do.	470	almost colourless
Caryoph. arom.	dry flowers	1.070	gets coloured by keeping
Citrus Aurant.	recent flowers	14 to 15	
——— medica,	rind	125	
Coriandr. sativ.	dry seeds	20	fluid light lemon colour,
Cumin. Cymin.	dry seeds	375.	light lemon
Hysopus off.	summits	19 to 23	light amber
Lavand. vera,	do.	125 to 120	light lemon
Lignum Rhodium,	wood	91 to 6	light, a little yel. very fragrant
Juniperus com.	recent fruit	125	fluid, amber
J. Sabina,	recent leaves	145 to 155	
Matric. Parth.	summits	16	light lemon
Mentha Piperita,	do.		
Myrtus caryoph.	bark	83	lemon, heavier than water, cryst. at 67°
Laurus Sassafras,	root rasped	125	amber, heavier than water
Origan. Majorana,	summits	25 to 60	a little lemon
——— vulgare,	do.	23 to 60	a little amber
Pimpin. Anisum,	dry seeds	215 to 275	white, cryst. at 53°
Piper Cubeba,	do.	104	light green, little smell, consistent, unctuous
Rosmar. officin.	recent leaves	62	
Rosa pallida,	recent flowers	1	butyraceous
Ruta graveolens,	seeds	125	
Salvia officin.	plant in flower	8 to 34	lemon yellow
Tanacet. vulgare,	recent herb	30	lemon
Thymus Serpyll.	do.	1 to 3	
Valeriana sylvest.	roots	55	

The choice of proper vessels is of great consequence for the performance of this process to advantage. There are some oils which pass freely over the swan neck of the head of the common still: others, less volatile, begin to condense on the least reduction of the temperature of the vapour. For obtaining these, a large head, having a rim or hollow canal round it, to detain and convey into the receiver whatever oil and water is condensed on the inside of the head, on an alembic with a short pipe and with a capital surmounted by a refrigeratory, (the cold-still of the older pharmaceutists) should be employed.

With regard to the body of the still, its shape should in some respects be the opposite of that preferred for the distillation of spirit. It should be deep in proportion to its width.

The water and vegetable matters together should never take up more than three-fourths of the still; there should, in short, be fluid enough to prevent any risk of burning, but not so much as to be in danger of boiling over into the receiver. The fragrance of some delicate flowers is impaired by immersing them in water. Dr Webster contrived a method of exposing them only to steam, instead of their being immersed in water. A proper quantity of water being put into the bottom of the still, the odoriferous herbs or flowers are laid lightly into a basket, of such a size that it may enter into the still, and rest against its sides, just above the water. The head being then fitted on, and the water made to boil, the steam, percolating through the subject, dissolves the oil, without impairing its fragrance, and carries it over into the receiver.

But the most certain method of avoiding all empyreuma and foreign flavour is by distillation *in vacuo.* By removing the pressure of the atmosphere, water boils at a temperature much below what is capable of decomposing any vegetable matter, and carries over with it volatile oil, if present, in a state of great purity. Accordingly, the most elegant volatile oils I have ever seen were prepared by distillation *in vacuo* by Mr Barry, the inventor of the process.

The fire ought to be quickly raised, and kept up during the whole process.

The form of the condensing apparatus should admit of its being readily cleaned, and freed from the flavour imparted by the preceding operation. Straight tubes are therefore preferable to the spiral worm used by distillers of spirits. As some of the oils readily congeal, such as those of anise and fennel, the water in the refrigeratory in such cases must not be colder than 42° Fahr.

Plants differ so much, according to the soil and season of which they are the produce, and likewise according to their period of growth, that it is impossible to fix the quantity of water to be drawn from a certain weight of them. The distillation may always be continued as long as the liquor comes over milky.

The mixture of water and oil which comes over may either be separated immediately, by means of an Italian receiver, or after it has been left at rest in large narrow-necked bottles, in a cool place, until the complete separation of the oil.

The water employed in the distillation of volatile oils always imbibes some portion of the oil, as is evident from the smell, taste, and milky colour which it acquires. It cannot, however, retain above a certain quantity; and hence, such as has been already used, and is therefore almost saturated, may be advantageously employed, instead of common water, in a second, or any future distillation of the same subject.

After the distillation of one oil, particular care should be had to clean the condensing apparatus perfectly before it be employed in the distillation of a different substance. Some oils, those of wormwood and aniseeds, for instance, adhere so tenaciously, as not to be melted out by heat, or washed off by water; the best way of removing these is to run a little spirit of wine through the condenser.

Volatile oils, after they are distilled, should be suffered to stand for some days, in vessels loosely covered with paper, till they have lost the disagreeable fiery odour which they have when newly distilled, and become limpid. They are then put up in small bottles, which are to be kept quite full, and closely stopped, in a cool place. With these precautions, they will retain their virtues in perfection for many years.

The distilled oils are frequently much adulterated. The grosser abuses may be readily detected. Thus, if the oil be mixed with alcohol, it will turn milky on the addition of water; if with expressed oils, they leave a greasy stain on paper, or alcohol will dissolve the volatile, and leave the other behind; if with oil of turpentine, on dipping a piece of paper in the mixture, and drying it with a gentle heat, the turpentine will be betrayed by its smell. But other methods of sophistication have been contrived, which elude all tests of this kind.

As all volatile oils agree in the general properties of solubility in spirit of wine, sparing solubility in water, miscibility with water by the intervention of certain substances, volatility in the heat of boiling water, &c., it is plain that they may be variously mixed with each other, and the dearer may be sophisticated with the cheaper, without any possibility of discovering the abuse by any trials of this kind: and, indeed, it is of as much importance that they be *good*, as that they be *genuine*; for genuine oils from inattentive distillation, and long and careless keeping, are often weaker, both in smell and taste, than the common sophisticated oils. The smell and taste seem to be the only certain tests of which the nature of the thing will admit. If a bark should have in every respect the appearance of good cinnamon, and should be proved indisputably to be the genuine bark of the cinnamon tree, yet if it want the cinnamon flavour, or have it but in a low degree, we reject it; and the case is the same with the oil. It is only from use and habit, or comparison with specimens of known quality, that we can judge of the goodness, either of the drugs themselves, or of their oils. Some of the volatile oils are too hot and pungent to be tasted accurately; but they may be diluted. A drop of the oil may be dissolved in spirit of wine, or received on a bit of sugar, and dissolved by that means in water. The quantity of liquor which it thus impregnates with its flavour, or the degree and quality of flavour which it communicates to a certain determinate quantity of liquor, will be the measure of the goodness of the oil.

Med. use.—Volatile oils, medicinally considered, agree in the general qualities of pungency and heat; in particular virtues, they differ as much as the subjects from which they are obtained, the oil being the direct principle in which the virtues, or at least a considerable part of the virtues, of the several subjects reside. Thus, the carminative virtue of the aromatic seeds, the diuretic of juniper berries, the emmenagogue of savine, the nervine of rosemary, the stomachic of mint, the cordial of aromatics, &c. are supposed to be concentrated in their oils.

The more grateful oils are frequently made use of for reconciling to the stomach medicines of themselves disgustful. It has been customary to employ them as correctors for the resinous purgatives, an use to which they do not seem to be well adapted. All the service they can here be of is, to make the resin sit more easily at first on the stomach; far from abating the irritating quality upon which the violence of its operation depends, these pungent oils superadd a fresh stimulus.

Volatile oils are never given alone, on account of their activity. They are readily imbibed by a piece of dry sugar, and in this form may be conveniently exhibited. Rubbed with eight or ten times their weight of sugar, they become soluble in aqueous liquors, and thus may be diluted to any assigned degree. Mucilages also render them miscible with water into an uniform milky liquor. They dissolve likewise in alcohol; the more fragrant in an equal weight, and almost all of them in less than four times their own weight. These solutions may be either taken on sugar, or mixed with viscid fluids. On mixing them with water, the liquor grows milky, and the oil separates.

The more pungent oils, as those of cinnamon and origanum, are employed externally against paralytic complaints, numbness, pains and aches, cold tumours, and in other cases where particular parts require to be heated or stimulated. The toothach is sometimes relieved by a drop of these almost caustic oils, received on cotton, and cautiously introduced into the hollow tooth.

Off. Prep.—Aq. cinnamomi, *D. L.* Spt. cinnam. *D. L.* Aq. menth. virid. *D. L.* Spt. menthæ virid. *D. L.* Infus. menth. comp. *D.* Aqua menth. piperit. *D. L.* Spt. menth. pip. *D. L.* Aq. menth. pulegii, *D. L.* Spt. menth. pulegii, *D. L.* Spt. rorismarini, *D. L.* Pilulæ aloes comp. *D. L.* Elect. scammonii, *D. L.* Elect. sennæ, *D.* Emplast. aromat. *D.* Spt. ammoniæ succinat. *L.* Tinctura aromat. ammon. *E.* Pil. rhæi comp. *E.* Pil. sulph. ferri comp. *E.*

OLEUM TEREBINTHINÆ. *Dub.*

Oil of Turpentine.

Take of Common turpentine, five pounds;
Water, four pints.
Draw off the oil in a copper alembic.
What remains in the retort, after the distillation of the oil, is *yellow resin.*

THE oil is never distilled from turpentine by the apothecary, but always procured from those who manufacture it in great quantities. This process is therefore omitted by the London and Edinburgh Colleges.

Off. Prep.—Oleum terebinthin. rectificat. *E. D. L.*

OLEUM VOLATILE PINI PURISSIMUM. *Ed.*

Purified Oil of Turpentine.

Take of Oil of turpentine, one pint;
Water, four parts.
Distil as long as any oil comes over.

OLEUM TEREBINTHINÆ RECTIFICATUM. *Lond. Dub.*

Rectified Oil of Turpentine.

Take of Oil of turpentine, one pint, (two pints, *Dub.*);
Water, four pints.

Distil the oil, (one pint and a half of oil, *Dub.*)

Oil of turpentine, as it occurs in commerce, is, from the action of the air, more or less resinous. To obtain it pure, it must be distilled again, according to the directions of the colleges, with water. This process is attended with some difficulty, on account of the rapid formation of the vapour, which is apt to cause the liquid to boil over, and of the inflammability of the vapours. Rectified oil of turpentine is colourless, perfectly limpid, transparent, has a high refracting power, sp. gr. 860 at 71°, or 872 at 50°. It boils at 313°. When cooled to —17°, its stearopte separates in white crystals, which sink in water, and melt at 20°. 100 parts of alcohol of 840 dissolve 13.5 of oil of turpentine at 70°, and in this way impure oil of turpentine may be rendered pure by agitating it with one-eighth part of such alcohol, which dissolves the resinified portion. When this process is repeated three or four times, the oil is quite pure, except that it retains one-fifth of the alcohol, which may be again separated by agitation with water. In this way small quantities of oil of turpentine may be conveniently rectified.

Med. use.—This has already been spoken of in the Materia Medica under the article *Pinus*, but Mr Kentish's employment of it in burns was merely alluded to. He first bathes the part with heated oil of turpentine, alcohol, or tincture of camphor, and then covers it up with rags dipped in oil of turpentine, melted with as much ointment of yellow resin as is sufficient to give it the consistence of a liniment. These are to be renewed one at a time, once a-day. As the inflammation subsides, less stimulating applications are to be used; and when the secretion of pus commences, the parts are then to be covered with powdered chalk, heated to the temperature of the body. In this way, he assures us that he cured very many extensive burns in a few weeks, which, under the use of cooling applications, would have required as many months, or would have been altogether incurable.

CHAP. XXI.

EMPYREUMATIC VOLATILE OILS.

EMPYREUMATIC OILS agree in many particulars with the volatile oils already treated of, but they also differ from them in several important circumstances. Berzelius has called them *Pyrelaines*. Volatile oils exist ready formed in the aromatic substances from which they are obtained, and the process of distillation only separates them as *educts* from the fixed principles. Pyrelaines, on the contrary, are always formed by the action of a degree of heat considerably higher than that of boiling water, and are the *product* of the decomposition, and a new arrangement of the elementary principles of substances, containing at least oxygen, hydrogen and carbon. Their production is therefore always attended with the formation of other new products. In their chemical properties they are in many respects analogous to the volatile oils, and are principally distinguished from them by their unpleasant pungent empyreumatic smell, and rough bitterish taste. They are also more apt to be affected by the contact of the air, becoming gradually deep coloured, and often depositing some black or flaky matter. The oftener they are redistilled, they become more limpid, less coloured, and more soluble in alcohol; whereas the essential oils, by repeated distillations, become thicker and less soluble in alcohol.

Their action on the body is exceedingly stimulant and heating.

OLEUM SUCCINI. *Lond.*
Oil of Amber.

Put amber into an alembic, and distil from it in a sand-bath, with a gradually increased heat, an acid liquor, oil and salt impregnated with oil. Then redistil the oil twice.

OLEUM SUCCINI PURISSIMUM. *Ed.*
Purified Oil of Amber.

Distil oil of amber in a glass retort, with six times its quantity of water, till two-thirds of the water have passed into the receiver; then separate this very pure volatile oil from the water, and preserve it in very close phials.

OLEUM SUCCINI RECTIFICATUM. *Dub.*
Rectified Oil of Amber.

Take of the oil which rises in the preparation of succinic acid, one pound;
Water six pints.

Distil until two-thirds of the water have come over; then separate the oil.

OIL OF AMBER, rectified by three distillations, has sp. gr. 758 at 75°, boils at 186°, is colourless, and as fluid as alcohol. It is very slowly changed by light and air, but gradually becomes black and hard. Water acquires its peculiar acrid taste and bituminous smell, without apparently dissolving any of it. It is soluble in every proportion in absolute alcohol, but requires five times its weight of spirit sp. gr. 825, and eight parts sp. gr. 847 at 55°, to dissolve it. It combines readily with oils. It dissolves by the assistance of heat, a little sulphur, phosphorus and iodine, and absorbs 2.5 its weight of chlorine and of ammonia gas.

Med. use.—Given in a dose of ten or twelve drops, it heats, stimulates and promotes the fluid secretions: it is chiefly celebrated in hysterical disorders, and in deficiencies of the uterine purgations. Sometimes it is used externally, in liniments, for weak or paralytic limbs, and rheumatic pains.

Empyreumatic oil is now procured in great quantity, and of extreme purity, as limpid as alcohol, and burning without residuum, as a bye product in the manufacture of coal gas; and in consequence of its cheapness it is now used for burning in lamps and in manufactures, as the dissolving of caoutchouc. As a medicinal article it is identical with the finest oil of amber, and in no respect inferior to the highly priced native naphtha.

CHAP. XXII.—DISTILLED WATERS.

AQUA DISTILLATA. *Lond.*
Distilled Water.

Take of Water, ten gallons.

Draw off by distillation, first, four pints; which being thrown away, draw off four gallons, which are to be kept in glass bottles.

Dub.

Take of Water, twenty pounds.

Put it into a glass retort, and having thrown away the first pound which comes over, draw off one gallon by distillation with a gentle heat.

Ed.

Let water be distilled in appropriate and very clean vessels, until about two-thirds have come over.

WATER is never found pure in a state of nature; and as it is absolutely necessary, particularly for many chemical operations, that it should be perfectly so, we must separate it from all heterogeneous matters by distillation. The first portion that comes over should be thrown away, both from the possibility of its being impregnated with volatile matters contained in the water, and from the probability that it will be contaminated with impurities it may have contracted in its passage through the worm in the refrigeratory. The distillation is not to be pushed too far, lest the water should acquire an empyreumatic flavour.

Although distilled water be necessary for some purposes, we apprehend that it is an error to order it in many receipts, such as infusions and decoctions, for which good spring water answers just as well.

AQUÆ STILLATITIÆ. *Ed.*

Distilled Waters[*].

As much water is to be added to the substance as will be sufficient to prevent empyreuma after ten pounds are drawn off. After due maceration, draw off ten pounds, to which are to be added five ounces of weak spirit.

AQUÆ DISTILLATÆ. *Dub.*

Distilled Waters.

To each pound of water, distilled from any vegetable substance, add half an ounce measure of rectified spirit.

Lond.

The waters are to be distilled from the dried herbs, unless otherwise ordered, because they are not to be had fresh at all times of the year. Whenever they are used fresh, their weight is to be doubled.

To every gallon of these waters add five fluidounces of proof-spirit, to preserve them.

AQUA ANETHI. *Lond.*

Dill Water.

Take of Dill seeds, bruised, one pound.

Pour upon them so much water, that enough may be left after the distillation to prevent empyreuma.

Draw off one gallon.

AQUA CARUI. *Dub.*

Caraway Water.

Take of the bruised seeds of caraway, one pound;

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[*] *Syn.* Chereau has distinguished the distilled waters by the terms *Hydrolates.*

Water, as much as may be sufficient to prevent empyreuma.

Distil off one gallon.

In the same manner, and in the same quantity, prepare,

AQUA	Water of
ANETHI. *Lond.*	Dill, *from one pound of the seeds, bruised.*
CARUI. *Lond.*	Caraway, *from one pound of the seeds bruised.*
CITRI AURANTII. *Ed.*	Orange-peel, *from two pounds of the fresh peel.*
CITRI MEDICÆ. *Ed.*	Lemon-peel, *from two pounds of the fresh peel.*
FŒNICULI. *Lond. Dub.*	Fennel, *from one pound of the bruised seeds.*
LAURI CASSIÆ. *Ed.*	Cassia, *from one pound of the bark bruised.*
LAURI CINNAMOMI. *Ed.*	Cinnamon, *from one pound of the bark bruised.*
CINNAMOMI. *Lond.*	——— *from one pound of the bark bruised, and macerated for twenty-four hours in a pint of water.*
——— *Dub.*	——— *from one pound of the bark bruised, and macerated for a day.*
MENTHÆ PIPERITÆ. *Ed.*	Peppermint, *from three pounds of the herb.*
——— PIPERITIDIS. *Dub.*	——— *from one pound and a half.*
——— PIPERITÆ. *Lond.*	——— *from one pound and a half of the herb dried, or twice the quantity of the fresh herb.*
MENTHÆ PULEGII. *Ed.*	Pennyroyal, *from three pounds of the herb.*
PULEGII. *Dub.*	——— *one and a half.*
——— *Lond.*	——— *one and a half dried, or double the quantity fresh.*
MENTHÆ SATIVÆ. *Dub.*	Spearmint, *one pound and a half.*
——— VIRIDIS. *Lond.*	——— *one pound and a half dried, or twice the quantity fresh.*
MYRTI PIMENTÆ. *Ed.*	Pimento, *half a pound bruised.*
PIMENTÆ. *Lond. Dub.*	——— *from half a pound bruised, and macerated for twenty-four hours in a pint of water.*
ROSÆ. *Lond. Dub.*	——— *from eight pounds of the petals of the hundred leaved rose.*

AQUA LAURO-CERASI. *Dub.*

Water of Cherry Laurel.

Take of Fresh leaves of cherry laurel, one pound;
Water, three pints.
Draw off one pint, and instead of rectified spirit, add of
Compound spirit of lavender, one ounce.

THE compound spirit of lavender is added to the cherry laurel water, that it may not be mistaken for any of the other distilled waters.

In the distillation of volatile oils, the water always retains a part of the oil in solution, and derives from it smell, taste, and virtue.

All those vegetables, therefore, which contain an essential oil, will give over some virtue to water by distillation; but the degree of the impregnation of the water, and the quantity of water which a plant is capable of saturating with its virtue, are by no means in proportion to the quantity of the oil that it seems to contain. Some odoriferous flowers, as for example the rose, whose oil is in so small quantity, that scarcely a trace of it appears, unless fifty or an hundred pounds or more are distilled at once, give nevertheless as strong an impregnation to water as those plants which abound most with oil.

I have here adopted the common opinion, that the smell and other properties of distilled waters depends upon their containing volatile oil; but this is not certain; nor is the opinion of Boerhaave, that the odour of the volatile oils themselves depends upon a different principle adhering to them, which he called *Spiritus rector*, to be rejected as unfounded. Robiquet also remarks, that plants do not owe their odour and properties solely to an essential oil. Many plants, or parts of plants, furnish, by distilling them with water, products of a different smell from that which their volatile oil possesses. As an example, he quotes orange-flower water, of which the smell does not at all resemble that of *oleum neroli.* The same is said of the water of valerian. There are many plants which are aromatic, and which, as the tuberose and jessamine, do not contain any volatile oil. It may therefore be concluded, that volatile oils are not always the cause of the scent of vegetables.

By the continental pharmaceutists there is a division of the distilled waters into the odorous and inodorous. The former only are used in this country, and the latter, as being destitute of the physical properties of smell and taste, are believed to be inert.

Along with the distilled water there always comes over some other vegetable principles, which impart to them at first a foreign flavour and taste, and cause them, if immediately corked closely up, to spoil and become fetid. It, however, soon escapes if the waters be kept for some time in a cool place, in lightly covered opaque vessels; after which they may be bottled and corked up. Still, however, simple distilled waters are apt to spoil, which is probably owing to some fixed vegetable principle forced over from negligent distillation; for if they be merely rectified by a second distillation, they will keep unchanged for many years.

It is for the purpose of making them keep better, that the British Colleges direct the addition of five ounces of proof spirit to every gallon of the distilled waters; but the suggestion of M. Chereau, that the proportion of alcohol should be put into the still-pot along with the vegetable and the water, seems to me to be preferable. The whole alcohol will be recovered in the first portion of water that comes over, and thus exert its whole preservative effect. It will be also purified from unpleasant flavours, and it will enable the water to bring over and retain more volatile oil in solution. For this very reason it would be an improper addition, when the object is to procure the volatile oil as a distinct product.

DISTILLED WATERS, *Second Method.* *Dub.*

Cinnamon water, Peppermint water, Mint water, and Pennyroyal water, may be prepared in another manner, *viz.* by adding to each gallon of water, instead of the herb, three drachms of its essential oil, and then applying heat, in a proper apparatus, to distil the mixture.

THIS method was introduced by the London College in 1824; but, in regard to cinnamon water, they direct five scruples only of oil, which, considering its acrimony, is perhaps enough. This method is preferable to the other. It furnishes a more pleasant and perfect product, and effectually precludes the possibility of their spoiling, as no mucilaginous principle can be present.

I find that some apothecaries form their distilled waters, by merely mixing the essential oil and water in due proportion, without distilling them together, and, what is worse, without filtering them after mixture. But the distillation should never be omitted, as the union is more complete, and the water more perfect; and, from negligence in omitting even filtration, I have seen the oils swimming on the surface of the water when dispensed, and have known patients injured by their acrimony. The want of economy is evident.

Med. use.—Distilled waters are employed chiefly as grateful diluents, as suitable vehicles for medicines of greater efficacy, or for rendering disgustful ones more acceptable to the palate and stomach; few of them, except laurel water, are depended on, with any intention of consequence, by themselves.

Off. prep. of rose water.—Mistura ferri comp. *D. L.*

——— *of pennyroyal water.*—Mistura ammoniaci, *D.* Mistura assæfœtidæ, *D.* Mistura moschi, *L.*

——— *of cinnamon water.*—Mistura guaiaci, *L.*

CHAP. XXIII.—DISTILLED SPIRITS *.

THE flavour and virtues of distilled waters are owing, as observed in a preceding chapter, to their being impregnated with a portion of the volatile oil of the subject from which they are drawn. Alcohol, considered as a vehicle for these oils, has this advantage above water, that it keeps all the oil, that rises with it, perfectly dissolved into an uniform limpid liquor, and allows no part of it to separate.

It is however remarkable, that while some aromatic substances readily yield their essential oil in distillation with spirit, others do not.

Thus, if cinnamon be distilled with proof-spirit, the alcohol will rise first, clear, colourless, and transparent, and almost without any taste of the spice; but, as soon as the more watery fluid begins to arise, the oil comes freely over with it, so as to render the liquor highly odorous, sapid, and of a milky hue.

The proof spirit usually met with in the shops is very rarely pure, or free from unpleasant flavour, which becomes very evident when employed for the preparation of distilled spirits. This nauseous flavour does not begin to arise till after the strongest alcohol has come over, which is the very time that the oil of the aromatics begins also to arise most plentifully; and hence the liquor receives an ungrateful taint. To this cause principally is owing the general complaint, that the cordials of the apothecary are less agreeable than those of the same kind prepared by the distiller; the latter being extremely curious in rectifying and purifying from all unpleasant flavour the spirits which he uses for what he calls Fine goods.

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* *Syn.* In the French Pharmacopœia distilled spirits are now called *Alcoholats.*

Spiritus stillatitii. *Ed.*
Distilled Spirits.

To the substance to be distilled, add nine pounds of weaker alcohol. Macerate for two days in a close vessel; then pour on as much water as will avoid empyreuma, and draw off nine pounds.

Spiritus carui. *Dub.*
Spirit of Caraway.

Take of Caraway seeds, bruised, one pound;
Proof-spirit, one gallon;
Water, sufficient to prevent empyreuma.
Macerate for twenty-four hours, and draw off one gallon.

Lond.

Take of Bruised caraway seeds, one pound and a half;
Proof-spirit, one gallon;
Water, enough to prevent empyreuma.
Macerate for twenty-four hours; and with a slow heat, distil one gallon.

In this manner, prepare in the same quantity,

Spiritus	*Spirit of*
Cari carui. *Ed.*	*Caraway*, half a pound, bruised.
Carui. *Dub.*	—— one pound, bruised.
—— *Lond.*	—— one pound and a half bruised.
Lauri cinnamomi. *Ed.* Cinnamomi. *Dub.*	*Cinnamon*, one pound bruised.
Menthæ piperitæ. *Ed.*	*Peppermint*, one pound and a half of the herb.
Myristicæ. *Lond.* Myristicæ moschatæ. *Ed.* Nucis moschatæ. *Dub.*	*Nutmeg*, two ounces, bruised.
Myrti pimentæ. *Ed.* Pimentæ. *Dub. Lond.*	*Pimento*, bruised, half a pound. *E.* — three ounces, *D.* two ounces, *L.*
Anisi. *Lond.*	*Aniseed*, half a pound, bruised.

The caraway spirit of the London College is stronger than the others, and the pimento spirit of Edinburgh much stronger than that of London or Dublin.

Spiritus cinnamomi. *Lond.*
Spirit of Cinnamon.

Take of Oil of cinnamon, by weight, five scruples;
Rectified spirit, four pints and a half.
Add the oil to the spirit, and pour on as much water as will prevent empyreuma after the distillation is finished. Then draw off one gallon with a slow fire.

In the same manner, draw off in the same quantity,

Spiritus	*Spirit of*
Menthæ piperitæ. *Lond.*	*Peppermint*, from six scruples and a half of oil of peppermint.
——— viridis. *Lond.*	*Mint*, from six scruples and a half of oil of mint.
Pulegii. *Lond.*	*Pennyroyal*, from seven scruples of oil of pennyroyal.
Rosmarini. *Lond.*	*Rosemary*, from one ounce of oil of rosemary, and a gallon of rectified spirit.

SPIRITUS MENTHÆ PIPERITÆ. *Dub.*

Spirit of Peppermint.

Take of Oil of mint, half an ounce;
Rectified spirit, one gallon.

Add the oil to the spirit, and pour on as much water as will prevent still-burning after the distillation is complete. Then draw off by a gentle heat one gallon.

Spirit of Mint is to be prepared in the same manner.

Spirit of Cinnamon, Pennyroyal, and Rosemary may be prepared by adding to a gallon of proof spirit, instead of the herb, six scruples of its essential oil, and distilling in a proper apparatus by a gentle heat.

The employment of the volatile oils, for the preparation of these distilled spirits, appears to me a great improvement, as it is both more economical, and prevents the possibility of empyreuma.

SPIRITUS LAVANDULÆ SPICÆ. *Ed.*

Spirit of Lavender.

Take of Flowering spikes of lavender, fresh, two pounds;
Stronger alcohol, eight pounds.

Draw off, in a water-bath, seven pounds.

SPIRITUS LAVANDULÆ. *Lond.*

Spirit of Lavender.

Take of Fresh lavender flowers, two pounds;
Rectified spirit, one gallon;
Water, sufficient to prevent empyreuma.

Macerate for twenty-four hours, and, with a slow fire, draw off one gallon.

Dub.

Take of Fresh lavender flowers, two pounds
Proof-spirit of wine, one gallon;
Water, sufficient to prevent empyreuma.

Macerate for twenty-four hours. Draw off, by a moderate heat, five pints.

By these directions, and in the same quantity is prepared,

SPIRITUS RORISMARINI OFFICINALIS. *Ed.*	*Rosemary*, two pounds.
SPIRITUS RORISMARINI. *Dub.*	——— a pound and a half.

Med. use.—It is unnecessary to make particular observations on each of these simple spirits, as their virtues are the same with those of the substances from which they are extracted, united to the stimulus of the alcohol.

The alcohol in the spirit of lavender and rosemary of all the Colleges, and that of the peppermint and mint of Dublin, is almost pure; in the others, it is diluted with about an equal weight of water.

Off. Prep. of Spirit of Nutmeg.—Mistura ferri comp. *D. L.*
——— *of Spirit of Cinnam.*—Infus. digitalis, *D. L. E.*
——— *of Spirit of Lavender.*—Spiritus lavand. comp. *D. E. L.* Linim. camph. comp. *D. L.*
——— *of Spirit of Rosemary.*—Spirit. lavand. comp. *D. L. E.* Linim. saponis, *D. L.*

SPIRITUS ANISI COMPOSITUS. *Dub.*
Compound Spirit of Aniseed.

Take of Aniseed bruised,
Angelica seed, bruised, of each half a pound;
Proof-spirit, one gallon;
Water, sufficient to prevent empyreuma.
Macerate for twenty-four hours. Draw off one gallon by distillation.

THIS is a simplification of the Irish usquebaugh, which is generally coloured, either yellow by saffron and arnotto, or green by sap green. These compound spirits are agreeable cordials; indeed they are too agreeable; for by some they are so often resorted to, on the slightest sensation of flatulence in the stomach, that their use is attended with all the pernicious consequences of dram-drinking.

SPIRITUS JUNIPERI COMPOSITUS. *Ed.*
Compound Spirit of Juniper.

Take of Juniper berries, bruised, one pound;
Caraway seeds,
Sweet fennel seeds, each, bruised, one ounce and a half;
Weaker alcohol, nine pounds.

Macerate for two days, and having added as much water as will prevent empyreuma, draw off, by distillation, nine pounds.

Lond.

Take of Juniper berries, bruised, one pound;
Caraway seeds,
Fennel seeds, of each, bruised, one ounce and a half;
Proof-spirit, a gallon;
Water, enough to prevent empyreuma.

Macerate for twenty-four hours, and distil, with a gentle heat, one gallon.

Dub.

Take of Juniper berries, bruised, one pound;
Caraway seeds, bruised,
Sweet fennel seeds, bruised, of each an ounce and a half;
Proof-spirit, a gallon.

Macerate for twenty-four hours, and then add as much water as will prevent empyreuma, and draw off one gallon;

THE good and bad effects of this spirit exactly coincide with those of gin. The Edinburgh and Dublin Colleges macerate only in the spirit; the London in the spirit and water.

SPIRITUS ARMORACIÆ COMPOSITUS. *Lond. Dub.*

Compound Spirit of Horse-Radish.

Take of Fresh horsh-radish root, sliced,
Dried orange-peel, of each one pound;
Nutmegs bruised, half an ounce;
Proof-spirit, one gallon;
Water, sufficient to prevent empyreuma.

Macerate for twenty-four hours, and distil, with a slow fire, one gallon.

THIS is an aromatic acrid spiritous liquor, which has no pretensions to the specific antiscorbutic properties formerly ascribed to it.

Off. Prep.—Infusum armoraciæ comp. *D.*

AMMONIATED SPIRITS.

TINCTURA ASSÆFŒTIDÆ AMMONIATA. *Ed.*

Ammoniated Tincture of Assafœtida.

Take of Ammoniated alcohol, eight ounces;
Assa fœtida, half an ounce.

Digest in a close vessel for twelve hours; then distil off, with the heat of boiling water, eight ounces.

SPIRITUS AMMONIÆ FŒTIDUS. *Lond.*
Fœtid Spirit of Ammonia.

Take of Spirit of ammonia, two pints;
Assa fœtida, two ounces.

Macerate for twelve hours; and distil, with a slow fire into a cooled receiver, one pint and a half.

Dub.

Take of Spirit of ammonia, two pints;
Assa fœtida, an ounce and a quarter.

Macerate in a close vessel, for three days, with occasional agitation. Pour off the clear liquor, and distil a pint and a half.

VOLATILE spirits, impregnated with different fœtids, have been usually kept in the shops as anti-hysterics: the ingredient here chosen is the best calculated of any for general use. The spirit is pale when newly distilled, but acquires a considerable tinge of brown by keeping.

TINCTURA AROMATICA AMMONIATA. *Ed.*
Aromatic Ammoniated Tincture.

Take of Ammoniated alcohol, eight ounces;
Volatile oil of rosemary, one drachm and a half;
Volatile oil of lemon-peel, one drachm.

Mix them, that the oils may be dissolved.

SPIRITUS AMMONIÆ AROMATICUS. *Dub.*
Aromatic Spirit of Ammonia.

Take of Spirit of Ammonia, two pints;
Essential oil of lemon, two drachms;
Nutmegs, bruised, half an ounce;
Cinnamon bark, bruised, three drachms.

Digest in a close vessel, for three days, with occasional agitation, and draw off a pint and a half.

Lond.

Take of Cinnamon bark, bruised,
Cloves, bruised, of each two drachms;
Lemon-peel, four ounces;
Subcarbonate of potass, half a pound;
Muriate of ammonia, five ounces;
Rectified spirit, four pints;
Water, one gallon.

Mix, and draw off six pints.

We have here three different modes of preparing a similar medicine. That of the Edinburgh College is a simple solution of the volatile oils in ammoniated alcohol, and succeeds perfectly if the ammonia in the solvent be caustic. Mr Phillips indeed says, that the oils as imported are commonly adulterated with fixed oil, which renders the aromatic spirit coloured and turbid, unless it be redistilled with them. Also if the ammoniated alcohol be weak and carbonated, it does not dissolve the oils, and it is therefore, in this case, the usual practice of chemists to distil the mixture of oils and spirit. This is partly the process of the Dublin College. In that of London, subcarbonate of ammonia is disengaged from muriate of ammonia decomposed by subcarbonate of potass, and combines with the spirit, and the compound spirit distils over impregnated with the volatile oils. Mr Phillips has pointed out that six ounces of subcarbonate of potass are insufficient to decompose five ounces of muriate of ammonia. Rather more than eight ounces are required.

Med. use.—This preparation has the same medicinal virtues as the simple ammoniated alcohol, but, from its combination with the aromatic oils, is a more agreeable remedy. The dose is from five or six drops to sixty or more.

Off. Prep.—Tinctura guaiaci ammon. *D. L.*

CHAP. XXIV.—INFUSIONS.

The term Infusion is confined to the action of a menstruum, not assisted by ebullition, on any substance consisting of heterogeneous principles, some of which are soluble, and others insoluble in that menstruum. It is generally used in a more extensive, but, we are inclined to think, a less correct sense: thus, lime-water and the mucilages, which are commonly classed with the infusions, are instances of simple solution. When the menstruum used is water, the solution is termed simply an Infusion *; but when the menstruum is alcohol, it is called a Tincture; when wine or vinegar, a Medicated Wine or Vinegar. Infusions in water are extremely apt to spoil, and are generally extemporaneous preparations.

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* In the nomenclature of M. Chereau, all compound medicines, of which water is the excipient, are called *Hydroolés.*

AQUA CALCIS COMPOSITA. *Dub.*
Compound Lime Water.

Take of Guaiac wood, in shavings, half a pound;
Liquorice root, sliced and bruised, an ounce;
Sassafras bark, bruised, half an ounce;
Coriander seeds, three drachms;
Lime-water, six pints.

Macerate, without heat, for two days, in a close bottle, with frequent agitation, and filter.

THIS, notwithstanding the name, may be considered as a compound infusion of guaiac, as the lime-water cannot fail to be decomposed during the preparation.

AQUA PICIS LIQUIDÆ. *Dub.*
Tar-Water.

Take of Tar, two pints;
Water, one gallon.

Mix, by stirring them with a wooden rod, for a quarter of an hour, and after the tar has subsided, strain the liquor, and keep it in well-corked bottles.

TAR-WATER should have the colour of white wine, and a sharp empyreumatic taste. It is, in fact, a weak pyrolignic acid, saturated with empyreumatic oil. It was at one time much extolled as a panacea, but has of late been little employed. It acts as a stimulant, raising the pulse, and increasing the discharge by the skin and kidneys. It may be drunk to the extent of a pint or two in the course of a day.

INFUSUM ACACIÆ CATECHU. *Ed.*
Infusion of Catechu.

Take of Extract of catechu, in powder, two drachms and a half;
Cinnamon bark, bruised, half a drachm;
Boiling water, seven ounces;
Simple syrup, one ounce.

Macerate the extract and cinnamon in the water, in a covered vessel, for two hours; then strain it through linen, and add the syrup.

INFUSUM CATECHU COMPOSITUM. *Lond. Dub.*
Compound Infusion of Catechu.

Take of Extract of catechu, two drachms and a half;
Cinnamon bark, bruised, half a drachm;
Boiling water, half a pint.

Macerate for an hour in a loosely covered vessel, and strain.

(Digest for an hour in a covered vessel, and strain through linen. *Dub.*)

As this preparation will not keep above a day or two, the must always be made extemporaneously. The long maceration, therefore, is often extremely inconvenient; but the preparation may be made in a few minutes, by boiling, without in the least impairing the virtue of the medicine.

Med. use.—Extract of catechu abounds with tannin. This infusion is therefore a powerfully astringent solution. The cinnamon and syrup render it sufficiently agreeable; and it will be found serviceable in diarrhœas proceeding from a laxity of the intestines. Its dose is a spoonful or two every second hour, or after every loose stool.

INFUSUM ANTHEMIDIS NOBILIS. *Ed.*
Infusion of Chamomile.

Take of Chamomile flowers, two drachms;
Water, eight ounces.

Macerate for twenty-four hours, in a slightly covered vessel, and strain.

INFUSUM ANTHEMIDIS. *Lond.* INFUSUM CHAMÆMELI. *Dub.*
Infusion of Chamomile.

Take of Chamomile flowers, two drachms;
Boiling water, half a pint.

Macerate for ten minutes, in a vessel loosely covered, and filter, *Lond.* (Digest for twenty-four hours, in a covered vessel, and strain through linen, *Dub.*)

THIS is a very common extemporaneous prescription, used under the title of *Chamomile tea.* It is a good stomachic.

INFUSUM ARMORACIÆ COMPOSITUM. *Lond. Dub.*
Compound Infusion of Horse-Radish.

Take of Fresh horse-radish root, sliced,
Mustard seed, bruised, of each one ounce;
Boiling water, one pint.

Macerate for two (six, *Dub.*) hours, in a (loosely, *Lond.*) covered vessel, and strain; then add, of
Compound spirit of horse-radish, one fluidounce.

THIS is a pungent and stimulant infusion.

INFUSUM AURANTII COMPOSITUM. *Lond.*
Compound Infusion of Orange-peel.

Take of Orange-peel, dried, two drachms;
Lemon-peel, fresh, one drachm;

Cloves, bruised, half a drachm;
Boiling water, half a pint.

Macerate for ten minutes (a quarter of an hour, *Dub.*) in a (loosely, *Lond.*) covered vessel, and strain.

A stomachic infusion.

INFUSUM BUCHU. *Dub.*

Infusion of Buchu.

Take of Buchu leaves, half an ounce;
Boiling water, half a pint.

Digest for four hours, and filter through linen.

THIS is a strong smelling infusion, which has been lately much praised in diseases of the urinary organs.

INFUSUM CALUMBÆ. *Lond.* INFUSUM COLOMBÆ. *Ed. Dub.*

Infusion of Colombo.

Take of Colombo root, sliced, two drachms, (one drachm, *Ed.*);
Boiling water, half a pint, (eight ounces, *Ed.*)

Macerate for two hours in a loosely covered vessel, and strain.

A stomachic bitter.

INFUSUM CARYOPHYLLORUM. *Lond. Dub.*

Infusion of Cloves.

Take of Cloves, bruised, one drachm;
Boiling water, half a pint.

Macerate for two hours in a vessel loosely covered, and strain.

AN aromatic stimulant.

INFUSUM CASCARILLÆ. *Lond. Dub.*

Infusion of Cascarilla.

Take of Cascarilla bark, bruised, half an ounce;
Boiling water, half a pint.

Macerate for two hours in a loosely covered vessel, and strain.

A slightly aromatic stimulant.

INFUSUM CINCHONÆ LANCIFOLIÆ. *Ed.*

Infusion of Cinchona Bark.

Take of The bark of lance-leaved cinchona, in powder, one ounce;
Water, one pound.

Macerate for twenty-four hours in a slightly covered vessel, with occasional agitation, and filter.

INFUSUM CINCHONÆ. *Lond.*
Infusion of Cinchona.

Take of The bark of lanced-leaved cinchona, bruised, half an ounce;
Boiling water, half a pint.

Macerate for two hours in a loosely covered vessel, and strain.

Dub.

Take of Crown bark, in coarse powder, one ounce;
Cold water, twelve ounces, by measure.

Triturate the bark with a little of the water, and add the remainder during the trituration. Macerate for twenty-four hours, with frequent agitation, and decant the pure liquor.

THIS is a very elegant form of exhibiting the active principles of cinchona bark, and that in which they will sit lightest on weak and delicate stomachs. The trituration directed by the Dublin College will promote the solution.

INFUSUM CUSPARIÆ. *Lond.* INFUSUM ANGUSTURÆ. *Dub.*
Infusion of Angustura.

Take of Angustura bark, bruised, two drachms;
Boiling water, half a pint.

Macerate for two hours in a loosely covered vessel, and strain.

A stimulant febrifuge.

INFUSUM DIGITALIS. *Lond.*
Infusion of Foxglove.

Take of Foxglove leaves, dried, one drachm;
Boiling water, half a pint.

Macerate for four hours in a loosely covered vessel, and strain; then add
Spirit of cinnamon, half a fluidounce.

Dub.

Take of Foxglove leaves, dried, one drachm;
Spirit of cinnamon, half an ounce;
Boiling water, half a pint.

Digest for twenty-four hours in a covered vessel, then filter, and add the spirit.

INFUSUM DIGITALIS PURPUREÆ. *Ed.*
Infusion of Foxglove.

Take of Dried leaves of foxglove, one drachm;

Boiling water, eight ounces;
Spirit of cinnamon, one ounce.

Macerate the leaves in the water, for four hours, in a slightly covered vessel, then add the spirit, and filter.

THIS is the infusion so highly recommended by Withering. Half an ounce or an ounce of it may be taken twice a-day in dropsical complaints. The spirit of cinnamon is added to retard its spoiling, and to counteract its sedative effects.

INFUSUM GENTIANÆ COMP., *vulgo* INFUSUM AMARUM. *Ed.*

Compound Infusion of Gentian, or Bitter Infusion.

Take of Gentian root, sliced, half an ounce;
Dried peel of Seville oranges, bruised,
Coriander seeds, bruised, each one drachm,
Diluted alcohol, four ounces;
Water, one pound.

First pour on the alcohol, and three hours thereafter add the water; then macerate without heat, for twelve hours, in a slightly covered vessel, and strain.

Lond. Dub.

Take of The root of gentian, sliced,
Dried orange-peel, of each one drachm;
Fresh lemon-peel, two drachms, (one drachm, *Dub.*);
Boiling water, twelve fluidounces.

Macerate for an hour in a loosely covered vessel, and strain.

THESE formulæ are essentially the same, except that in the London and Dublin prescription there is no spirit, while in that of Edinburgh its proportion is considerable, one to three of the water, which must be attended to in prescription. The Edinburgh College also adds coriander seeds, and employs the largest proportion of gentian: they also infuse it in cold water, which dissipates less of the flavour of the aromatics, and does not dissolve the mucilaginous principles so readily. The Edinburgh infusion keeps good for a very long time. The others get mouldy.

Med. use.—Gentian is the strongest and purest of the European bitters, and readily imparts its virtues to water. These infusions are in very common use as stomachic and tonic.

INFUSUM LINI USITATISSIMI. *Ed.*

Infusion of Linseed.

Take of Linseed, one ounce;

Liquorice root, bruised, two drachms;
Boiling water, two pounds.
Digest for four hours in a slightly covered vessel, and strain.

INFUSUM LINI COMPOSITUM. *Lond. Dub.*

Compound Infusion of Linseed.

Take of Linseed, bruised, one ounce;
Liquorice root, sliced, half an ounce;
Boiling water, two pints.
Macerate for four hours, (near the fire, *Lond.*) in a closely covered vessel, and strain.

THIS is a mucilaginous emollient liquor, commonly called *linseed tea,* much used in gonorrhœas, strangury, and in pectoral complaints.

INFUSUM MENTHÆ SIMPLEX. *Dub.*

Simple Infusion of Mint.

Take of Mint leaves dried, two drachms;
Boiling water enough to furnish six fluidounces of filtered infusion.

MINT tea is an agreeable diaphoretic, but it is chiefly used as the excipient of more active remedies.

INFUSUM MENTHÆ COMPOSITUM. *Dub.*

Compound Infusion of Mint.

Take of The leaves of spearmint, dried, two drachms;
Boiling water, as much as will afford six ounces of the infusion, when filtered.
Digest for half an hour, in a covered vessel; strain the liquor when cold, and then add of
Double refined sugar, two drachms;
Oil of spearmint, three drops, dissolved in
Compound tincture of cardamoms, half an ounce.
Mix.

THIS infusion is slightly stimulating and diaphoretic, and forms a very agreeable herb-tea, which may be used in any quantity in diet, or as a vehicle for more active remedies.

INFUSUM QUASSIÆ EXCELSÆ. *Ed.*

Infusion of Quassia.

Take of Shavings of quassia wood, half a drachm;
Boiling water, eight ounces.
Macerate for two hours in a slightly covered vessel, and strain.

INFUSUM QUASSIÆ. *Lond. Dub.*

Infusion of Quassia.

Take of Quassia shavings, a scruple;
Boiling water, half a pint.
Macerate for two hours in a loosely covered vessel, and strain.

ONE of the most intense and pure bitters.

INFUSUM RHEI. *Ed.*

Infusion of Rhubarb.

Take of Russian rhubarb, bruised, half an ounce;
Boiling water, eight ounces;
Spirit of cinnamon, one ounce.
Macerate the rhubarb in a close vessel with the water for twelve hours; then add the spirit, and strain the infusion.

Lond.

Take of Rhubarb root, sliced, a drachm;
Boiling water, half a pint.
Macerate for two hours in a loosely covered vessel, and strain.

THIS appears to be one of the best preparations of rhubarb when not designed as a purgative, water extracting its virtues more effectually than either vinous or spiritous menstrua.

INFUSUM ROSÆ GALLICÆ. *Ed.*

Infusion of Roses.

Take of The petals of red roses, dried, one ounce;
Boiling water, two pounds and a half;
Diluted sulphuric acid, half an ounce;
White sugar, one ounce.
Macerate for four hours the petals with the boiling water in an earthen vessel, which is not glazed with lead, then add the acid, strain the liquor, and dissolve the sugar in it.

INFUSUM ROSÆ COMPOSITUM. *Lond.*

Compound Infusion of Roses.

Take of Dried petals of red roses, half an ounce;
Diluted sulphuric acid, three fluidrachms;
Double refined sugar, an ounce and a half;
Boiling water, two pints and a half.
First pour the water on the petals in a glass vessel, then add the diluted sulphuric acid, and macerate for half an hour. Strain the liquor, and add to it the sugar.

INFUSUM ROSÆ ACIDUM. *Dub.*
Acid Infusion of Roses.

Take of The petals of red rose buds, dried and heeled, half an ounce;
Diluted sulphuric acid, three fluidrachms;
Boiling water, three pints;
Double refined sugar, an ounce and a half.

First pour the water on the petals in a glass vessel, then add the acid, and digest for half an hour; filter the liquor when cold, and add the sugar.

THE difference in the directions for preparing this infusion are immaterial. In fact, the rose leaves have very little effect, except in giving the mixture a fine red colour. The subacid and astringent virtues of the infusion depend entirely on the sulphuric acid. Altogether, however, it is an elegant medicine, and forms a very grateful addition to juleps in hæmorrhagies, and in all cases which require mild refrigerants and subastringents. It is often used as the solvent of saline remedies, is sometimes taken along with boluses or electuaries of Peruvian bark, and likewise makes a good gargle.

INFUSUM SARSAPARILLÆ COMP. *Dub.*
Compound Infusion of Sarsaparilla.

Take of Sarsaparilla root, previously cleansed with cold water, and then sliced, one ounce;
Lime-water, one pint.

Macerate for twelve hours in a close vessel, with frequent agitation, then filter.

A COLD infusion is a very fit form for sarsaparilla, but the propriety of the formula given by the Dublin College may be doubted. In the first place, the active principle is so very soluble in cold water, according to the observations of Mr Battley, that the cleansing with cold water cannot fail to impair the virtues of the root; and in the second place, the propriety of using lime-water as the solvent is very much to be doubted. In fact, distilled water is probably the fittest solvent, and if any addition were to be made, a very little acid would be more scientific than lime-water.

INFUSUM CASSIÆ SENNÆ. *Ed.*
Infusion of Senna.

Take of Senna leaves, six drachms;
Ginger root, bruised, one scruple;
Boiling water, nine ounces.

Macerate for an hour in a slightly covered vessel, and strain,

INFUSUM SENNÆ COMPOSITUM. *Lond. Dub.*
Compound Infusion of Senna.

Take of Senna leaves, one ounce and a half; (one ounce, *Dub.*)
Ginger root, sliced, one drachm;
Boiling water, one pint.

Macerate them for an hour in a loosely covered vessel, and strain.

THESE are convenient purgative infusions, but they differ considerably in strength; the senna being in the London, Edinburgh and Dublin receipts nearly as 1 to 10.5; 12 and 16 respectively. To increase its purgative action, an ounce of sulphate of magnesia may be dissolved in eight ounces. Half of this quantity may be taken for a dose. It rarely fails to produce copious fluid evacuations.

Ed.

Take of Preserved tamarinds, one ounce;
Senna leaves, one drachm;
Coriander seeds, bruised, one drachm;
Brown sugar, half an ounce;
Boiling water, eight ounces.

Macerate for four hours, with occasional agitation, in a close earthen vessel, not glazed with lead, and strain the infusion.

It may also be made with double, triple, &c. the quantity of senna.

INFUSUM SENNÆ CUM TAMARINDIS. *Dub.*
Infusion of Senna with Tamarinds.

Take of Senna leaves, one drachm;
Tamarinds, one ounce;
Coriander seeds, bruised, one drachm;
Brown sugar, half an ounce;
Boiling water, eight ounces.

Digest in a close earthen jug, not glazed with lead, for four hours, and filter.

It is also made with double the quantity of senna.

THIS forms a mild and useful purge, excellently suited for delicate stomachs, and inflammatory diseases. The taste of the senna is well covered by the acidity of the tamarinds.

It is perhaps not superfluous to point out the confusion in the nomenclature of the different Colleges; *Inf. Sennæ comp.* of the London and Dublin, being synonymous with the simple infusion of Edinburgh, and the *Inf. sennæ comp.* of

Edinburgh, being the *Infusum sennæ cum tamarindis* of Dublin.

INFUSUM SIMAROUBÆ. *Lond. Dub.*
Infusion of Simarouba.

Take of Simarouba bark, bruised, half a drachm;
Boiling water, half a pint.
Macerate for two hours in a loosely covered vessel, and strain.

A simple bitter.

INFUSUM TABACI. *Lond. Dub.*
Infusion of Tobacco.

Take of Tobacco leaves, a drachm;
Boiling water, a pint.
Macerate for an hour in a loosely covered vessel, and strain.

THIS is a narcotic diuretic, which was used with much success in dropsies by Dr Fowler.

INFUSUM VALERIANÆ. *Dub.*
Infusion of Valerian.

Take of Wild valerian root, in coarse powder, two drachms;
Boiling water, seven fluidounces.
Digest for an hour, and strain when cold.

VALERIAN tea is a very excellent antispasmodic, and often proves serviceable in hysteric cases, where the stomach will not bear the powder in substance.

CHAP. XXV.—DECOCTIONS *.

DECOCTIONS differ from infusions only in the action of the menstruum being assisted by a boiling heat. The increase of temperature facilitates and expedites the solution of some fixed principles, and so far as these are active it increases the power of the medicine, but at the same time it also extracts inert and nauseous principles, which remain undissolved by simple infusion. By boiling water often extracts more of some of the principles than it can retain when cold, and hence decoctions become muddy, and deposite on cooling.

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* In the nomenclature of M. Chereau, these preparations fall under the denomination of *Hydroolés* when they are officinal, and *Hydroolites* when extemporaneous. But as these terms do not indicate the mode of preparation, he also calls them *Decoctés*.

Likewise it gives some principles a tendency to decomposition, and dissipates all volatile matters. Decoction, therefore, can only be used with advantage for the extraction of principles which are neither volatilized nor altered by a boiling heat.

To promote the action of the menstruum, infusion is frequently premised to decoction, and they are thus occasionally conjoined, the *Infuso-decocta* of foreign pharmaceutists.

In compound decoctions, it is sometimes convenient not to put in all the ingredients from the first, but in succession, according to their hardness, and the difficulty with which their virtues are extracted; and if any aromatic, or other substances, containing volatile principles, enter into the composition, the boiling decoction is to be simply poured upon them, and covered up until it cool.

Decoctions should be made in vessels sufficiently large to prevent any risk of boiling over, and should be continued without interruption, and gently.

Decoctum aloes compositum. *Lond. Dub.*
Compound Decoction of Aloes.

Take of Extract of liquorice, half an ounce;
Subcarbonate of potass, two sruples;
Socotorine aloes, (Hepatic aloes, *Dub.*) in powder,
Myrrh, in powder,
Saffron, of each one drachm;
Water, one pint;
Compound tincture of cardamoms, four fluidounces.

Boil the liquorice, subcarbonate of potass, aloes, myrrh, and saffron, with the water, down to twelve fluidounces, and filter, then add the compound tincture of cardamom.

This is a saponaceous solution of aloes, the subcarbonate of potass rendering its resin soluble in water; and in many cases of stomach complaints, the combination of an alkali with a bitter purgative may be advantageous. In the dose of two or three tea-spoonfuls it is slightly purgative.

Decoctum anthemidis nobilis. *Ed.*
Decoction of Chamomile,

Take of Chamomile flowers, dried, one ounce;
Caraway seeds, bruised, half an ounce;
Water, five pounds.

Boil for a quarter of an hour, and strain.

Decoctum chamæmeli compositum. *Dub.*
Compound Decoction of Chamomile.

Take of Chamomile flowers, dried, half an ounce;

Sweet fennel seeds, two drachms;
Water, one pint.
Boil a little, and strain.

DECOCTUM MALVÆ COMPOSITUM. *Lond.*
Compound Decoction of Mallow.

Take of The leaves of mallow, dried, one ounce;
Chamomile flowers, dried, half an ounce;
Water, one pint.
Boil for fifteen minutes, and strain.

THESE decoctions are merely solutions of bitter extractive, combined, in the third with mucilage, and in the others with aromatics. In making them, the aromatic substances should not be added until the decoction is nearly completed; for, otherwise, their flavour will be entirely dissipated.

They are coarse preparations, and used chiefly as glysters. It must, however, be acknowledged, that, in general, the bulk and warmth of these produce a discharge before their medicinal principles they contain can have any effect.

As fomentations, their virtues also depend, in a great measure, on the warm water, of which they principally consist; and when the herbs themselves are applied, they act only as retaining heat and moisture for a longer time, and are a less convenient, and not more useful fomentation, than cloths wrung out of hot water, or, what is still better, bladders half filled with hot water.

Off. Prep.—Enema catharticum, *D.*

DECOCTUM CINCHONÆ LANCIFOLIÆ. *Ed.*
Decoction of Cinchona Bark.

Take of Lance-leaved cinchona bark, bruised, one ounce;
Water, one pound and a half.
Boil for ten minutes in a covered vessel, and strain the liquor while hot.

DECOCTUM CINCHONÆ. *Lond.*
Decoction of Cinchona.

Take of Lance-leaved cinchona bark, bruised, one ounce;
Water, one pint.
Boil for ten minutes in a loosely covered vessel, and strain the liquor while hot.

Dub.

Take of Crown bark, in coarse powder, one ounce;
Water, enough to yield a pint of strained decoction.

Pelletier, to whom we owe so great an extension of our knowledge of vegetable pharmacy, has commented upon the decoction of cinchona. He says, that by the prolonged action of boiling water, the cinchonate of cinchonia is dissolved, but at the same time the gum, starch, yellow colouring matter, cinchonate of lime, tannine, and a portion of the cinchonic red are dissolved. These substances carry with them even a notable proportion of the greasy matter. The decoction clear as long as it is boiling, becomes turbid on cooling, because the tannine, united to the starch, forms a compound insoluble in cold water; a part of the cinchonic red and greasy matter also separates, but these unfortunately carry with them a part of the cinchonia. We may, however, in part remedy these inconveniences, by increasing the quantity of the solvent, by which means almost all the cinchonia may be retained in solution; we may then filter the decoction, and concentrate it by evaporation. By this means M. Caventou thinks we may prepare a decoction less turbid, less disagreeable to take, and possessed of all the virtues the preparation can possess.

DECOCTUM DAPHNES MEZEREI. *Ed.* DECOCT. MEZEREI. *Dub.*
Decoction of Mezereon.

Take of The bark of mezereon, two drachms;
Liquorice root, bruised, half an ounce;
Water, three pounds.

Boil (with a gentle heat, *Ed.*) down to two pounds, and strain the decoction.

From four to eight ounces of this decoction may be given four times a-day, in some obstinate syphiloid and rheumatic affections. It operates chiefly by perspiration.

DECOCTUM DULCAMARÆ. *Lond. Dub.*
Decoction of Bittersweet.

Take of Twigs of bittersweet, sliced, one ounce;
Water, one pint and a half.

Boil to a pint, and strain.

For the virtues of this decoction, I must refer to what is said in the Materia Medica.

DECOCTUM GEOFFROYÆ. *Dub.*
Decoction of Cabbage-tree Bark.

Take of Bark of cabbage-tree, bruised, one ounce;
Water, two pounds.

Boil to one pound, and to the filtered liquor add,
Syrup of orange-peel, two ounces.

DECOCTUM GEOFFRÆÆ INERMIS. *Ed.*

Decoction of Cabbage-tree Bark.

Take of Bark of the cabbage-tree, powdered, one ounce;
Water, two pounds.

Boil, with a gentle fire, down to one pound, and strain the decoction.

THIS is a powerful anthelmintic. It may be given in doses of one table-spoonful to children, and four to adults. If disagreeable symptoms should arise from an over dose, or from drinking cold water during its action, we must immediately purge with castor oil, and dilute with acidulated fluids.

DECOCTUM GUAIACI COMPOSITUM. *Ed.*

Compound Decoction of Guaiacum.

Take of Guaiacum raspings, three ounces;
Raisins, two ounces;
Sassafras root, sliced,
Liquorice root, bruised, each one ounce;
Water, ten pounds.

Boil the guaiacum and raisins with the water, over a gentle fire, down to five pounds, adding, towards the end, the sassafras and liquorice, and strain the decoction.

Dub.

Take of Shavings of guaiac wood, three ounces;
Sassafras root, sliced, ten drachms;
Liquorice root, bruised, two ounces and a half;
Water, ten pints.

Boil the guaiac wood in the water down to one half, and towards the end of the decoction, add the liquorice and sassafras, and strain the liquor.

THIS decoction is of use in some rheumatic and cutaneous affections. It may be taken by itself to the quantity of a quarter of a pint, twice or thrice a-day, or used as an assistant in a course of mercurial or antimonial alteratives; the patient, in either case, keeping warm, in order to promote the operation of the medicine.

DECOCTUM GLYCYRRHIZÆ. *Dub.*

Decoction of Liquorice.

Take of Liquorice root bruised, an ounce and a half;
Water, one pint.

Boil for ten minutes, and strain.

THIS is a very good demulcent and vehicle for active remedies whose taste is unpleasant.

DECOCTUM HÆMATOXYLI. *Dub.*
Decoction of Logwood.

Take of Raspings of logwood, an ounce and a half;
Cinnamon bark bruised, one drachm;
Water, two pints.

Boil the raspings in the water, and evaporate to one-half. Towards the end of the decoction, add the cinnamon, and strain.

THIS decoction is slightly astringent, and is a popular and useful remedy in slight diarrhœa from relaxation.

DECOCTUM PAPAVERIS. *Lond. Dub.*
Decoction of Poppies.

Take of White poppy heads, sliced, four ounces;
Water, four pints, (two pints, *Dub.*)

Boil for a quarter of an hour, and strain.

THIS is in very common use as an anodyne fomentation.

DECOCTUM POLYGALÆ SENEGÆ. *Ed.*
Decoction of Seneka.

Take of Seneka root, one ounce;
Water, two pounds.

Boil down to sixteen ounces, and strain the decoction.

DECOCTUM SENEGÆ. *Lond. Dub.*
Decoction of Seneka.

Take of Seneka root, one ounce, *Lond.;* three drachms, *Dub.*
Water, two pints, *Lond.;* one pound and a half, *Dub.*

Boil to one pint, and strain, *Lond.;* to eight ounces, and strain, *Dub.*

THE virtues of this decoction will be easily understood from those of the root from which it is prepared. The dose in hydropic cases, and rheumatic or arthritic complaints, is two ounces, three or four times a-day, according to its effect. It is also recommended in affections of the lungs, attended with debility, and inordinate secretion.

DECOCTUM PYROLÆ. *Dub.*
Decoction of Winter Green.

Take of Winter green, one ounce;
Water, two pints.

Macerate for six hours; then take out the herb, bruise it, and return it to the liquor. Evaporate the mixture to one pint of expressed decoction.

THIS decoction is given to the extent of a pint daily as a diuretic in dropsies, and also as a palliative in strangury and nephritis.

DECOCTUM QUERCUS ROBORIS. *Ed.*

Decoction of Oak Bark.

Take of Oak bark, bruised, one ounce;
Water, two pounds and a half.
Boil down to sixteen ounces, and strain.

DECOCTUM QUERCUS. *Lond. Dub.*

Decoction of Oak Bark.

Take of Oak bark, one ounce;
Water, two pints.
Boil to one pint, and strain.

THIS is a very powerful astringent, and may be used on all occasions where astringents are indicated. It is particularly serviceable as a gargle in sore throats and hoarseness, attended with relaxation of the parts.

DECOCTUM SMILACIS SARSAPARILLÆ. *Ed.*

Decoction of Sarsaparilla.

Take of The root of sarsaparilla, sliced, six ounces;
Water, eight pounds.
Digest for two hours, with a heat of about 195°; then take out the root, and bruise it; when bruised, put it back into the same liquor, boil down to four pounds, then press out, and strain the decoction.

DECOCTUM SARSAPARILLÆ. *Dub.*

Decoction of Sarsaparilla.

Take of Sarsaparilla root, sliced, and cleansed with cold water, four ounces;
Boiling water, four pounds.
Digest with a moderate heat for four hours, in a loosely covered vessel; then take out the root, and bruise it. Put it back into the liquor, boil down to two pints, and filter.

Lond.

Take of Sarsaparilla root, sliced, four ounces;
Boiling water, four pints.
Macerate for four hours in a loosely covered vessel, at the side of the fire; then take out the sarsaparilla root, and bruise it. When bruised put it again into the liquor: macerate for two hours more, then boil down to two pints, and strain.

THE diaphoretic effects of this decoction are probably owing to its being drunk warm. By some it is thought useful in the sequelæ of true syphilis, and in syphiloid affections its good effects are generally allowed.

Off. Prep.—Decoct. sarsap. comp. *L. D.*

DECOCTUM SARSAPARILLÆ COMPOSITUM. *Dub. Lond.*

Compound Decoction of Sarsaparilla.

Take of Decoction of sarsaparilla, boiling hot, four pints;
Sassafras root, sliced, (and bruised, *Dub.*)
Guaiac wood, rasped,
Liquorice root, bruised, of each an ounce;
The bark of mezereon root, three drachms.
Boil for a quarter of an hour, and strain.

THIS compound decoction is said to be an improved mode of preparing the once highly celebrated Lisbon diet-drink, which, after its first introduction into Britain, was so long kept a secret.

It operates as a diaphoretic, and may be given with advantage in rheumatic cases, and in some of the sequelæ of syphilis. Three or four ounces may be taken four times a-day.

DECOCTUM TARAXACI. *Dub.*

Decoction of Dandelion.

Take of Fresh dandelion herb and root, four ounces;
Water, two pounds;
Boil down to one pound, and filter the expressed liquor.

THIS decoction is mucilaginous, and slightly bitter. It was at one time much prescribed as a diuretic, and is now fashionable as an alterative in hepatic diseases.

DECOCTUM ULMI. *Lond. Dub. Ed.*

Decoction of Elm.

Take of The fresh inner bark of elm, bruised, four ounces;
Water, four pints, (four pounds, *Ed.)*
Boil to two pints, (two pounds and a half, *Ed.)*

UNDER this form the elm bark has been highly celebrated for the cure of certain cutaneous eruptions, but undeservedly, according to the experience of the most judicious practitioners.

DECOCTUM VERATRI. *Lond. Dub.*

Decoction of White Hellebore.

Take of The root of white hellebore, (in powder, *D.)* one ounce;
Water, two pints;
Rectified spirit of wine, two fluidounces.

Boil the water with the root to one pint, and strain; after the liquor is cold, add to it the spirit.

This decoction is only used externally as a wash in porrigo, lepra, psora, &c. When the skin is very tender, and irritable, it should be diluted with an equal quantity of water. In estimating the virtues of this decoction, we must keep in mind that it contains a portion of the narcotic principle, *veratria*, to which the colchicum owes its powers.

Chap. XXVI.—MUCILAGES[*].

Mucilago acaciæ arabicæ. *Ed.*
Mucilage of Gum Arabic.

Take of Gum arabic, in powder, one part;
Boiling water, two parts.

Digest with frequent agitation uutil the gum be dissolved; then press the mucilage through linen.

Mucilago acaciæ. *Lond.*
Mucilage of Acacia.

Take of Gum arabic, in powder, four ounces;
Boiling water, half a pint.

Triturate the gum with the water, gradually added, until it be dissolved.

Mucilago gummi arabici. *Dub.*
Mucilage of Gum Arabic.

Take of Gum arabic, in coarse powder, four ounces;
Boiling water, four ounces, by measure.

Digest with frequent agitation till the gum be dissolved, then strain the mucilage through linen.

Gum Arabic is a substance so easily altered by heat, that it is changed even by boiling water poured upon it, and by being powdered. To prepare very fine mucilage, we must suspend the pieces of gum entire, tied up in a muslin rag, merely immersed in the water. As fast as it dissolves, the heavy mucilage sinks to the bottom, and fresh water comes in contact with the gum until the whole be dissolved. Prepared according to the directions of the colleges, mucilage is always more or less turbid, and has an acid smell.

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[*] *Syn.* These preparations are called *Mucolites* by M. Chereau.

It is scarcely necessary to observe, that the mucilage of the Dublin College is twice as strong as that of the others. This is an advantage, as it is sometimes required of this strength, and it can be readily reduced to any strength. It is an excellent demulcent, and useful in pharmacy.

Off. Prep.—Mistura cretæ, *D.*

DECOCTUM ALTHÆÆ OFFICINALIS. *Ed.* DECOCT. ALTHÆÆ. *D.*

Decoction of Marshmallow.

Take of Dried marshmallow roots, (and herb dried, *D.*) bruised, four ounces;
Raisins, stoned, two ounces;
Water, seven pounds, (pints, *D.*)

Boil down to five pounds, (pints, *D.*;) strain the decoction, and after the fæces have subsided, pour off the liquor.

MARSHMALLOW roots abound with mucilage. This decoction is therefore to be considered merely as an emollient, rendered more pleasant by the acidulous sweetness of the raisins.

MUCILAGO AMYLI. *Dub.*

Mucilage of Starch.

Take of Starch, six drachms;
Water, one pint.

Triturate the starch, gradually adding the water; then boil them a little.

Ed. Lond.

Take of Starch, three drachms;
Water, one pint.

Triturate the starch with the water, gradually added, and boil till it become a mucilage.

THE mucilage thus formed is very useful in those cases where a glutinous substance is required. It is often successfully employed as a glyster, in diarrhœas depending on acrimony in the intestines.

MUCILAGO ASTRAGALI TRAGACANTHÆ. *Ed.*

Mucilage of Gum Tragacanth.

Take of Gum tragacanth, in powder, two drachms;
Boiling water, eight ounces.

Macerate for twenty-four hours, then triturate carefully, that the gum may be dissolved; and press the mucilage through a linen cloth.

MUCILAGO GUMMI TRAGACANTHÆ. *Dub.*

Mucilage of Gum Tragacanth.

Take of Gum tragacanth, in powder, two drachms;
Water, eight ounces, by measure.

Macerate in a close vessel, till the gum be dissolved; then strain the mucilage through linen.

GUM tragacanth is difficultly soluble in water. When macerated in it, it swells, but does not dissolve. To effect the solution, it must be beaten into a paste with some of the water, and the rest of the water must be added gradually, and incorporated with the paste, by beating them together. Gum tragacanth requires a very large proportion of water to form a fluid mucilage.

DECOCTUM CYDONIÆ. *Lond.*

Decoction of Quince-seed.

Take of Quince-seeds, two drachms;
Water, one pint.

Boil, with a slow fire, for ten minutes, and strain.

THIS mucilage, though sufficiently agreeable, is perfectly superfluous, especially as it is apt to spoil, from being mixed with the other principles of the seeds soluble in water. It is, besides, never so transparent as mucilage carefully prepared from gum arabic, is not cheaper, and is unfit for many purposes, being coagulated by acids.

DECOCTUM HORDEI DISTICHI. *Ed.* DECOCT. HORDEI. *Dub.*

Decoction of Barley. Barley Water.

Take of Pearl barley, two ounces;
Water, five pounds.

First wash off the mealy matter which adheres to the barley with some cold water; then extract the colouring matter, by boiling it a little, with about half a pint of water. Throw this decoction away, and put the barley thus purified into five pints of boiling water, which is to be boiled down to one half, and strain the decoction.

DECOCTUM HORDEI. *Lond.*

Decoction of Barley.

Take of Pearl barley, two ounces;
Water, four pints and a half.

First wash off all foreign matters from the barley with cold water; than add half a pint of the water, and boil a little. Throw this water away, and pour on the barley the remaining water boiling hot; boil down to two pints, and strain.

DECOCTUM HORDEI COMPOSITUM. *Dub.*
Compound Decoction of Barley.

Take of The decoction of barley, four pints;
Raisins stoned,
Figs, sliced, dried, of each two ounces;
Liquorice root, sliced and bruised, half an ounce.

During the boiling, add first the raisins and then the figs, and lastly the liquorice, a short time before it is finished, when the strained decoction ought to measure two pints.

Lond.

Take of Decoction of barley, two pints;
Figs, sliced, two ounces;
Liquorice root, sliced and bruised, half an ounce;
Raisins, stoned, two ounces;
Water, one pint.

Boil down to two pints, and strain.

THESE liquors are intended to be used freely, as diluting drinks, in fevers and other acute disorders; hence it is of consequence that they should be as agreeable as possible: for this reason they are inserted in the Pharmacopœia, and the several circumstances which contribute to their elegance set down. As they are much oftener prepared by nurses and servants than by the apothecary, such receipts might, with great advantage, be substituted for the ridiculous, and often dangerous, specifics with which domestic cookery books abound.

Med. use.—This has been in use at least since the days of Hippocrates, who wrote a whole book concerning the use of boiled barley and barley water in acute diseases.

DECOCTUM LICHENIS ISLANDICI. *Ed.*
Decoction of Iceland Moss.

Take of Iceland moss, one ounce;
Water, two pounds.

Boil down to sixteen ounces, and strain.

Dub.

Take of Iceland moss, half an ounce;
Boiling water, a pint.

Digest for two hours in a close vessel; then boil for a quarter of an hour, and strain the liquor while hot.

DECOCTUM LICHENIS. *Lond.*
Decoction of Iceland Moss.

Take of Iceland moss, one ounce;
Water, a pint and a half.

Boil to a pint, and strain.

I have already given my opinion of the nature and effects of this mucilage. As in the present preparation the bitter principle is not removed, it may have some action as a tonic; but it renders it at the same time too nauseous to be used in sufficient quantity to have much effect as an article of diet.

Chap. XXVII.—SYRUPS.

Sugar is a much more important article in the pharmacy of the Continent than of this country, and the classification of the preparations into whose composition it enters has been an object of discussion. MM. Chereau and Henry use the term *Saccharoliques* for the order, or to include all preparations which contain sugar. This is divided into three genera; *Saccharolés*, in which the sugar predominates, *Saccharides*, in which it only acts the medium, and *Oleo-saccharolés*, formed of volatile oil and sugar. The saccharolés differ in consistency; when liquid they correspond to our syrups, when soft to our jellies, and when solid to our lozenges and tablets. The saccharides are either soft, our electuaries and conserves, or solid, constituting pills.

Syrups are solutions of sugar in any watery fluid, whether simple or medicated.

Syrupus simplex. *Ed.*
Simple Syrup.

Take of Refined sugar, fifteen parts;
Water, eight parts.

Let the sugar be dissolved by a gentle heat in the water, and boiled a little so as to form a syrup.

Lond.

Take of Refined sugar, two pounds and a half;
Water, one pint.

Dissolve the sugar in the water, in a water-bath; let it stand for twenty-four hours, then skim it, and decant off the pure syrup from the fæces, if there be any.

Dub.

Take of Double refined sugar, in fine powder, twenty-nine ounces;
Water, one pint.

Add the sugar gradually to the water, and digest in a close vessel, with a moderate heat and frequent agitation, until it be dissolved. Lastly, pour off from the dregs, if there be any.

Simple syrup should have neither flavour nor colour. It is more convenient in extemporaneous prescription, than sugar undissolved. Simple syrup is nutritious and demulcent. When made of fine sugar, it is transparent and colourless. If necessary, it is easily clarified, by beating to a froth the white of an egg, with three or four ounces of water, mixing this with the syrup, and boiling the mixture for a few seconds, until the albumen coagulates, and enveloping all heterogeneous matters, forms a scum, which may be easily taken off, or separated by filtration.

Off. Prep.—Confectio opii, *D. L.* Syrupus balsami Tolutani, *D. E.* Inf. acac. catechu, *E.*

SYRUPI. *Dub.*

Syrups.

In making syrups, where neither the weight of the sugar, nor the manner of dissolving it are directed, the following rule is to be followed:

Take of Double refined sugar, in fine powder, twenty-nine ounces;
The liquor prescribed, one pint.

Gradually add the sugar, and digest with frequent agitation, in a close vessel, and in a moderate heat, until it be dissolved; then set it aside for twenty-four hours; skim it, and pour off the syrup from the dregs, if there be any.

Lond.

Syrups are to be kept in a place whose temperature never exceeds 50° Fahr.

When, instead of simple water, any other fluid is used for dissolving the sugar, the syrup is then said to be medicated. Medicated syrups are prepared with expressed juices, infusions, decoctions, or saline fluids. The object of forming these into syrups is either to render them agreeable to the palate, or to preserve them from fermentation. In the latter case, the quantity of sugar added becomes a matter of great importance; for, if too much be employed, the sugar will separate by crystallization; and, if too little, instead of preventing fermentation, it will accelerate it. About two parts of sugar to one of fluid are the proportions directed by the

British Colleges with this view. But, as in some instances a larger quantity of fluid is added, and afterwards reduced to the proper quantity by decoction, it will not be superfluous to point out some circumstances, which shew the evaporation to be carried far enough. These are the tendency to form a pellicle on its surface, when a drop of it is allowed to cool: the receding of the last portion of each drop, when poured out drop by drop, after it is cooled; and what is most to be relied on, its specific gravity being about 1.3, when boiling hot, or 1.385, when cold.

Dr Macculloch says, that, by the addition of a little sulphate of potass, or chlorate of potass, a salt which has no taste, the fermentation of syrups may be prevented. M. Chereau has found the same good effect in regard to the syrup of white poppy heads from the sugar of milk, which has a sweet taste, and is not susceptible of fermentation. The proportions are 32 to 1000 of syrup.

Carbonell first proposed the division of syrups into those made by solution, and those by decoction, which has been adopted by Chereau, and other distinguished French pharmaceutists. The present classification is into three kinds. 1*st*, syrups by solution; 2*d*, syrups by reduction or evaporation; 3*d*, syrups by solution and by reduction jointly. In general, syrups which are made by reduction are little or not at all aromatic; are commonly compound syrups; require to be clarified; may be prepared in the open air; require the employment of some means to ascertain their density accurately; retain more extractive matter, and are more fermentable. Syrups by solution are more sapid, more aromatic, more simple in their composition. They seldom require to be clarified. They ought for the most part to be prepared in close vessels. Their density is previously calculated, and it is scarcely necessary to have recourse to a comparative measure. As they retain only volatile principles, they are also less disposed to fermentation. Syrups obtained by both means reunited, partake of the physical qualities common to the one and the other, since each mode of preparation is successively employed. Thus each kind of syrup has very distinct characters.

SYRUPUS ACETI. *Ed.*

Syrup of Vinegar.

Take of Vinegar, five parts;
Refined sugar, seven parts.
Boil them, so as to form a syrup.

Med. use.—This is to be considered as simple syrup merely acidulated, and is by no means unpleasant. It is employed in mucilaginous and other mixtures; and, on account of its cheapness, it is often preferred to syrup of lemons.

SYRUPUS ALTHÆÆ OFFICINLIS. *Ed.*
Syrup of Marshmallow.

Take of Fresh marshmallow roots, sliced, one part;
Water, ten parts;
Refined sugar, four parts.

Boil the water with the roots, down to one-half, and strain the liquor, with strong expression. Set aside the strained decoction till the fæces have subsided; add the sugar to the depurated decoction, and boil so as to make a syrup.

SYRUPUS ALTHÆÆ. *Lond. Dub.*
Syrup of Marshmallow.

Take of Fresh root of marshmallow, bruised, half a pound;
Refined sugar, two pounds;
Water, four pints.

Boil the water with the marshmallow root to one-half, and press out the liquor when cold. Set it at rest for twenty-four hours; and after the fæces have subsided, pour off the decoction. Add the sugar, and boil it down to the proper consistence.

WHEN prepared according to the directions of Pharmacopœias, by decoction and evaporation, this is a very viscous syrup, containing much starch, and very prone to fermentation. Hence the new French Pharmacopœia orders a slight ebullition only. M. Chereau goes still farther, and has given a method of preparing this syrup without starch, as he considers the demulcent property to reside entirely in the mucilage, although M. Robiquet is not satisfied that the starch is useless. The following is M. Chereau's method, and it may serve as an example of the great attention paid on the continent to the preparation of syrups. Take of the dried root of marshmallow of Nismes 6 ounces or 180 parts, cut it very small, and pour on it 4 pounds of water or 4000 parts. Allow it to macerate for twenty-four hours. The infusion thus obtained by maceration when cold has a fine amber yellow colour. It retains in a great measure the taste and smell of the marshmallow, and does not contain starch. The infusion is then passed through a close white sieve, and 12 pounds or 6000 parts of white sugar are added, which is to be dissolved in a water-bath. The syrup, if necessary, is strained a second time, but after it is cold.

Med. use.—This is merely a mucilaginous syrup, and is chiefly used in nephritic cases, and for sweetening emollient decoctions.

SYRUPUS AMOMI ZINGIBERIS. *Ed.*
Syrup of Ginger.

Take of Ginger root, in powder, six drachms;
Boiling water, one pound;
Refined sugar, twenty-two ounces.

Macerate the ginger in the water, in a close vessel, for twenty-four hours; strain the infusion, add the sugar, and dissolve it with a gentle heat.

SYRUPUS ZINGIBERIS. *Dub.*
Syrup of Ginger.

Take of Ginger root, bruised, four ounces;
Boiling water, three pints.

Macerate for twenty-four hours, and strain; then add the refined sugar, and make into a syrup.

Lond.

Take of Ginger, sliced, two ounces;
Boiling water, one pint;
Refined sugar, two pounds.

Macerate the ginger in the water for four hours, and strain; then add the sugar as directed for making syrup.

Med. use.—This is an agreeable and moderately aromatic syrup, impregnated with the flavour and virtues of the ginger.

Off. Prep.—Elect. opiat. *E.* Elect. catechu comp. *D.*

SYRUPUS CASSIÆ SENNÆ. *Ed.*
Syrup of Senna.

Take of Senna leaves, two ounces;
Boiling water, a pound and a half;
Molasses, eight ounces.

Macerate the leaves in the water in a slightly covered vessel for four hours, and strain; then add the molasses, and boil with a gentle heat to the thickness of a syrup.

SYRUPUS SENNÆ. *Lond.*
Syrup of Senna.

Take of Senna leaves, two ounces;
Fennel seeds, bruised, one ounce;
Manna, three ounces;

Refined sugar, one pound;
Boiling water, a pint.

Macerate with a gentle heat the senna leaves and fennel seeds in the water for one hour. Strain the liquor, and mix with it the manna and sugar, then boil to a proper thickness.

THIS preparation, which is intended to be an officinal substitute for an excellent nursery purgative, is a proof of the impropriety of colleges sanctioning prescriptions which they have not brought to the test of experiment. The ingredients, as given by the Dublin College in their first edition, yielded, instead of a fluid syrup, a substance so thick, that it could not even be shaked out of an inverted vessel, owing to the crystallization of the manna. In the recent edition it is omitted. Even in the receipt of the London College, the manna separates by crystallization. Treacle is the best addition for forming infusion of senna into a syrup, as it has no tendency to crystallize, and covers its taste so completely, that children take it readily.

SYRUPUS CITRI AURANTII. *Ed.*

Syrup of Orange-peel.

Take of The fresh outer rind of Seville oranges, three ounces;
Boiling water, one pound and a half,
Refined sugar, three pounds.

Macerate the rind in the water for twelve hours in a covered vessel; then add to the filtered liquor the sugar, in powder, and with a gentle heat, form a syrup.

SYRUPUS AURANTII. *Dub.*

Syrup of Orange-peel.

Take of Fresh outer rind of Seville oranges, eight ounces;
Boiling water, six pints.

Macerate for twelve hours, in a covered vessel; and, in the strained liquor, dissolve refined sugar to make a syrup.

SYRUPUS AURANTIORUM. *Lond.*

Orange Syrup.

Take of Fresh orange rind, two ounces;
Boiling water, one pint;
Refined sugar, three pounds.

Macerate the rind in the water, in a loosely covered vessel, for twelve hours; then pour off the liquor, and add to it the sugar.

IN making this syrup, it is particularly necessary that the sugar be previously powdered, and dissolved in the infusion, with as gentle a heat as possible, to prevent the exhalation of the volatile parts of the peel. With these cautions, the syrup proves very agreeable, possessing a great share of the fine flavour of the orange-peel.

Off. Prep.—Elect. arom. *E.*

SYRUPUS CITRI MEDICI. *Ed.*

Syrup of Lemons.

Take of Juice of lemons, filtered after the fæces have subsided, three parts;
Refined sugar, five parts.

Dissolve the sugar.

SYRUPUS LIMONIS. *Dub.*

Syrup of Lemons.

Take of Fresh lemon juice, two pints.

Put the juice, as soon as the dregs have subsided, into a matrass, and digest it with the heat of boiling water for a quarter of an hour. When cold pass it through a searce, and make into a syrup.

SYRUPUS LIMONUM. *Lond.*

Lemon Syrup.

Take of Lemon juice, strained, one pint;
Refined sugar, two pounds.

Dissolve the sugar in the lemon juice, in the same manner as directed for the formation of simple syrup.

Med. use.—These are very pleasant cooling syrups; and with this intention they are occasionally used in draughts and juleps, for quenching thirst, abating heat, &c. in bilious or inflammatory distempers. They are sometimes likewise employed in gargarisms for inflammations of the mouth and tonsils.

SYRUPUS COLCHICI AUTUMNALIS. *Ed.*

Syrup of Colchicum.

Take of Colchicum root, fresh, cut into thin slices, one ounce;
Vinegar, sixteen ounces;
Refined sugar, twenty-six ounces.

Macerate the root in the vinegar for two days, occasionally shaking the vessel; then strain the infusion with gentle expression. To the strained infusion add the sugar, and boil a little, so as to form a syrup.

We must take care to gather the root in the proper season; and, from inattention in this respect, we are to ascribe the uncertainty observed in the effects of this medicine.

Med. use.—It was chiefly employed as a diuretic, and may be taken from a drachm or two to the extent of an ounce or more.

SYRUPUS CROCI. *Lond.*

Syrup of Saffron.

Take of Saffron, one ounce;
Boiling water, one pint;
Refined sugar, two pounds and a half.

Macerate the saffron in the water for twelve hours, in a loosely covered vessel; and dissolve the sugar in the strained liquor.

SAFFRON is very well fitted for making a syrup. It is said to be a pleasant cordial, and gives a fine colour to juleps.

SYRUPUS DIANTHI CARYOPHYLLI. *Ed.*

Syrup of Clove July-flower.

Take of Clove July-flowers, fresh gathered and freed from the heels, one part;
Boiling water, four parts;
Refined sugar, seven parts.

Macerate the petals in the water for twelve hours; and dissolve in the filtered infusion the sugar in powder, by a gentle heat, so as to form a syrup.

As the beauty of the colour is principally attended to in this syrup, no force should be used in expressing the infusion from the flowers. It is rarely prepared from the petals alone, and there is often substituted for it a syrup easily prepared at all seasons: An ounce of spice-cloves is infused for some days in twelve ounces of white wine, the liquor strained, and, with the addition of twenty ounces of sugar, boiled to the proper consistence of a syrup, to which a little cochineal gives a colour exactly similar to that prepared from the clove July-flower; and its flavour is of the same kind, though not so pleasant. The counterfeit may be readily detected, by adding to a little of the syrup, some alkaline salt or ley, which will change the genuine syrup to a green colour; but, in the counterfeit, it will make no such alteration, only varying the shade of the red.

SYRUPUS MORI. *Lond.*

Syrup of Mulberry.

Take of Mulberry juice, strained, one pint;
Refined sugar, two pounds.

Dissolve the sugar in the mulberry juice, as directed for simple syrup.

It is found that this syrup retains the smell of the mulberry more perfectly, when, after having lightly mixed this fruit with the sugar in the pan, they are put together over the fire, because the odour resides in the skin of the fruit, as it does in that of the raspberry, &c.

Med. use.—It is an acidulous syrup, and may be added to mixtures and juleps.

SYRUPUS PAPAVERIS SOMNIFERI. *Ed.*

Syrup of White Poppy.

Take of White poppy heads, dried, and freed from the seeds, one part;
Boiling water, fifteen parts;
Refined sugar, two parts.

Macerate the sliced heads in the water for twelve hours; boil the infusion till only one-third part of the liquor remain; then strain the decoction with strong expression. Boil the strained decoction to one-half, and strain again; lastly, add the sugar, and boil a little, so as to form a syrup.

Dub.

Take of Poppy heads, dried and bruised, without the seeds, seventeen ounces;
Boiling water, two gallons.

Macerate the capsules in the water for twenty-four hours, then reduce in a water-bath to one gallon, and express the liquor strongly. Evaporate it after filtration to two pounds, and filter again while still hot. Set it aside for twelve hours, that the dregs may deposite; then boil the defecated liquor down to one pound, and make into a syrup.

SYRUPUS PAPAVERIS. *Lond.*

Syrup of Poppy.

Take of The heads of white poppies, dried and bruised, without the seeds, fourteen ounces;
Refined sugar, two pounds;
Boiling water, two gallons and a half.

Macerate the capsules in the water for twenty-four hours; boil them to one gallon in a water-bath, and strongly press out the decoction. Boil this down, after being strained, to two pints, and strain it while hot; set it aside for twelve hours that the fæces may subside. Boil the liquor, poured off from the fæces, to one pint, and dissolve the sugar in it, in the manner directed for making syrup.

This syrup, impregnated with the narcotic matter of the poppy-heads, is given to children, in doses of two or three drachms, and to adults, of half an ounce to an ounce and upwards, for easing pain, procuring rest, and answering the other intentions of mild opiates. Particular care is requisite in its preparation, that it may be always made, as nearly as possible, of the same strength; and accordingly the colleges have been very minute in their descriptions of the process, although, Mr Phillips justly remarks, the use of a water-bath in forming the decoction, as directed by the London College, is unnecessary.

SYRUPUS PAPAVERIS RHŒADIS. *Dub.*

Syrup of Red Poppy.

Take of The fresh petals of the red poppy, one pound;
Boiling water, twenty ounces by measure.

Put the flowers by degrees into the boiling water. After this, the vessel being removed from the fire, and taken out of the bath, macerate in a gentle heat for twelve hours; then press out the liquor, and set it apart, that the dregs may subside. Lastly, make it into a syrup with refined sugar.

SYRUPUS RHŒADOS. *Lond.*

Syrup of Red Poppy.

Take of Fresh petals of red poppy, one pound;
Boiling water, one pint and two fluidounces;
Refined sugar, two pounds and a half.

Gradually put the petals into the water, heated in a water-bath, stirring it occasionally; then having removed the vessel from the fire, macerate for twelve hours; express the liquor, and set it aside to let the impurities settle at the bottom; then add the sugar, as directed for syrup.

The design of putting the flowers into boiling water in a water-bath is that they may be a little scalded, so as to shrink enough to be all immerged in the water: without this precaution they can scarcely be all got in; but they are to be continued no longer over the fire than till this effect is produced, lest the liquor become too thick, and the syrup be rendered ropy.

As a medicine it is perfectly insignificant, although considered anodyne.

SYRUPUS RHAMNI. *Lond.*

Syrup of Buckthorn.

Take of The fresh juice of buckthorn berries, four pints;
Ginger, sliced,

Pimento berries, powdered, of each half an ounce;
Refined sugar, three pounds and a half.

Set aside the juice for three days that the fæces may subside, and then strain it. To one pint of the defæcated juice, add the ginger and pimento; then macerate with a gentle heat for four hours, and filter. Boil away the rest of the juice to one pint and a half; mix the liquors, and add the sugar as directed for making syrup.

Dub.

Take of Fresh buckthorn juice, two pints and a half;
Ginger root sliced,
Pimento berries bruised, of each three drachms.

Set the juice at rest to deposite its dregs, and strain. Add to ten ounces of the defæcated juice the ginger and pimento; macerate for twenty-four hours, and filter. Boil down the rest of the juice to a pint, and make into a syrup.

The proportion of juice to sugar in the London formula is about 60 to 42, and in that of Dublin about 40 to 29. In the last Parisian Codex, equal parts are employed, which is thought by some to render it too weak. Another difference is in the previous preparation of the juice. In the British pharmacopœias the juice separated by filtration from husks and seeds, is left at rest for some days to deposite; whereas, in that of Paris, introduced by Deyeux, the juice is fermented for some days upon the husks and seeds before filtration. It is thus rendered vinous, and acquires a reddish colour, whereas in its natural state it is green. In becoming red by acetic acid, formed at the expense of the mucilage, and in being freed from the mucilage, it is doubtful if it does not lose a little of that matter analogous to resins which M. Vogel found in it, and if its purgative property is not diminished. "In the fermented juice there exist no longer sugar, azotiferous matter, or in sensible quantity mucilage; but a greater proportion of acetic acid."

Med. use.—Syrup of buckthorn was a favourite remedy with Sydenham in dropsies. He says it evacuated the water alone, in some cases, in almost incredible quantity, without disturbing the circulation, or rendering the urine highly coloured, like other purgatives. It was also a popular remedy, and called *Domestic syrup*, but has long been, perhaps, in unmerited desuetude. In doses of three or four spoonfuls, it operates as a brisk cathartic. The principal inconveniences attending it are, its being very unpleasant, and its occasioning thirst and dryness of the mouth and fauces, and sometimes violent gripes: these effects may be prevented by drinking liberally water gruel, or other warm liquids, during the operation.

SYRUPUS ROSÆ GALLICÆ. *Ed.*
Syrup of Red Roses.

Take of The dried petals of red roses, one part;
Refined sugar, two parts;
Boiling water, nine parts.

Macerate the rose leaves in the water, for twelve hours; then boil a little, and strain the liquor; add to it the sugar, and boil again for a little, so as to form a syrup.

Med. use.—This syrup is supposed to be mildly astringent, but is principally valued on account of its red colour.

Off. Prep.—Elect. catechu comp. *E.*

SYRUPUS ROSÆ CENTIFOLIÆ. *Ed.*
Syrup of Hundred-leaved Rose.

Take of The fresh petals of the hundred-leaved rose, one part;
Boiling water, four parts;
Refined sugar, three parts.

Macerate the petals in the water for twelve hours; then to the strained infusion add the sugar, and boil them into a syrup.

SYRUPUS ROSÆ. *Lond.*
Syrup of Roses.

Take of The dried petals of the hundred-leaved rose, seven ounces;
Refined sugar, six pounds;
Boiling water, four pints.

Macerate the rose leaves in the water for twelve hours, and strain. Evaporate the strained liquor, in a water-bath, to two pints and a half, and add the sugar, as directed for making syrup.

Dub.

Take of The dried petals of the cabbage rose, seven ounces;
Boiling water, four pints.

Macerate the petals in the water for twelve hours, and strain. Evaporate the liquor to two pints and a half, then add the sugar to make a syrup.

Med. use.—This syrup is an agreeable and mild purgative for children, in the dose of half a spoonful, or a spoonful. It likewise proves gently laxative to adults; and with this intention may be of service in costive habits.

Off. Prep.—Elect. cassiæ fistulæ, *E. L.* Confectio scammon. *L. D.*

SYRUPUS SARSAPARILLÆ. *Lond. Dub.*
Syrup of Sarsaparilla.

Take of Sarsaparilla root, sliced, one pound;
Boiling water, one gallon;
(Refined sugar, one pound, *Lond.*)

Macerate the root in the water for twenty-four hours; then boil down to four pints, and filter the liquor while still hot; then add the sugar, and (evaporate to the proper consistence, *Lond.*) (make into a syrup in the manner prescribed, *Dub.*)

Med. use.—This is a new syrup, for which I apprehend we are more indebted to fashion than to observation. I am unacquainted with its use. Mr Phillips says it is employed as an adjunct to the decoction of sarsaparilla; but from Mr Brande we learn that it is a convenient and portable form for the administration of sarsaparilla, is not liable to ferment, and is not disagreeable when diluted with water; that it has lately been much prescribed, and hence, probably, its introduction into the Pharmacopœia; that it is improved by the addition of a few cloves, and may be taken as an alterative in the dose of a desert spoonful three or four times a-day, and that the sugar is very apt to disagree with some stomachs.

SYRUPUS SCILLÆ MARITIMÆ. *Ed.*
Syrup of Squills.

Take of Vinegar of squills, four parts;
Refined sugar, in powder, seven parts.

Dissolve the sugar with a gentle heat, so as to form a syrup.

THIS syrup is used chiefly in doses of a spoonful or two, for promoting expectoration, which it does very powerfully. It is also given as an emetic to children.

SYRUPUS TOLUIFERÆ BALSAMI. *Ed.* SYRUP. BALS. TOLUT. *Dub.*
Syrup of Balsam of Tolu.

Take of Common syrup, two pounds, (one pound and a half, *Dub.*);
Tincture of balsam of Tolu, one ounce.

With the syrup just prepared, and when it has almost grown cold, after having been removed from the fire, gradually mix the tincture with constant agitation.

SYRUPUS TOLUTANUS. *Lond.*

Syrup of Tolu.

Take of The balsam of Tolu, one ounce ;
Boiling water, one pint ;
Refined sugar, two pounds.

Boil the balsam in the water for half an hour in a covered vessel, stirring it occasionally; strain the liquor when cold, and add the sugar as in making simple syrup.

The intention of the contrivers of the two foregoing processes seems to have been somewhat different. In the latter, which is certainly the most elegant, the benzoic acid of the balsam alone is contained, and the syrup is clear and colourless ; the other syrup contains the whole substance of the balsam in large quantity, and is white and opaque. They are both moderately impregnated with the agreeable flavour of the balsam.

SYRUPUS VIOLÆ ODORATÆ. *Ed.*

Syrup of Violets.

Take of Fresh violets, two parts ;
Boiling water, eight parts ;
Refined sugar, fifteen parts.

Macerate the violets in the water, for twenty-four hours, in a covered glass or glazed earthen vessel ; then strain without expression, and to the strained infusion add the sugar.

SYRUPUS VIOLÆ. *Dub.*

Syrup of Violets.

Take of The fresh petals of the violet, two pounds ;
Boiling water, five pints.

Macerate for twenty-four hours ; afterwards strain the liquor, without expression, through fine linen. Add refined sugar, that it may be made a syrup.

Pewter vessels are preferred for making the infusions of the violets, on account of an unexplained property which it possesses of improving its colour. The violets, on being taken out of the water-bath, are not even entirely deprived of their colour. After they have been lightly expressed, if a small quantity of boiling water is poured on them, a fine blue colour is still obtained. At Paris the simple cultivated violets are preferred. Four pounds of violets bought in bunches, on one occasion gave fourteen ounces of cleansed flowers. The syrup of violets is an example of a medicated syrup by solution. It is apt, however, to lose, on keeping, the blue colour, for which it is chiefly valued ; and hence some have been induced to counterfeit it, with materials whose colour is more permanent, and which are more easily obtained. If the syrup be genuine, acids will change it red, and alkalies green; but if counterfeit, these changes will not happen; and a prescriber would be deceived, if he should expect, by means of it, to give a red tinge to acidulated, or blue to alkalized juleps or mixtures. From this mutability of colour, the true syrup of violet forms an excellent test of the presence of acids and alkalies.

Med. use.—This syrup has a very agreeable flavour; and, in the quantity of a spoonful or two, proves to children gently laxative, probably from the small quantity of emetine it contains.

CHAP. XXVIII.—MEDICATED HONEYS[*].

MEL DESPUMATUM. *Dub. Lond. Ed.*

Clarified Honey.

Melt the honey in a water-bath, and remove the scum as it rises.

IN this simple process, the honey is rendered so liquid by the heat of the boiling water, that the wax and other lighter impurities which it commonly contains rise to the surface, in the form of a scum, which is easily removed. At the same time, sand or any heavy mixture of that kind sinks to the bottom.

Honey is much employed in the pharmacy of the continent, and its clarification is there of great importance. M. Borde gives the following process for clarifying common honey.

Take common yellow honey ℔x., powdered vegetable charcoal ℥x., animal charcoal ℥v., nitric acid, sp. gr. 1285, or muriatic acid ʒx., common water ℥x. Triturate in a porcelain mortar the two charcoals with the nitric acid and the water; add the honey; put the whole into a tinned pan; leave the mixture on the fire for eight or ten minutes without allowing it to boil; then add 50 oz. milk; boil it four or five minutes; withdraw it from the fire; pass it through a straining-bag in a warm place; return what first passes if it be not clear enough. The acid in this operation combines in part with the charcoal, and in part with the caseous matter of the milk.

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[*] Medicated honeys are called *Mellita* in the French Codex, and *Melolés* by M. Chereau.

The process for clarifying fine honey is from Lowitz, and is less complex, and followed generally in France. Take white honey ℔ vi., water ℔ iss., powdered chalk ℥ iij., charcoal washed, dried, calcined, pulverized, and sifted, ℥ vi., two whites of eggs mixed with water ℔ i. Dissolve the honey in the water by the aid of heat; raise it to ebullition; then add the chalk little by little and stir it; remove it from the fire after it has boiled three minutes, and put in the charcoal; bring it to boil anew, and two minutes after pour in the albuminous water in three portions; shake it each time, and the ebullition being sustained for two minutes longer, withdraw it from the fire; allow it to cool; filter it through flannel until it pass colourless. The residuum washed with warm water serves for a new operation.

By this treatment of honey with water, charcoal, and chalk, a syrup is obtained, as clear and colourless as that of sugar, and which is not inferior to it in quality; a little of that taste, however, which honey contracts from heat, is always to be recognised in it. This is the only difference between them, but it exists even when honeys of the first quality are employed. 280 parts of honey treated in this manner yield 265 of syrup.

Honey was supposed to be peculiarly balsamic, and was therefore at one time much used in pharmacy. But as its saccharine matter is absolutely of the same nature with that of sugar, and as the extraneous matters which it always contains make it disagree with the stomachs of many individuals, the number of medicated honeys has been much diminished, and their place in some instances supplied by syrups. Medicated honeys are known to be of a proper consistence, by allowing a small quantity to cool on a plate, if, when divided by the edge of a spoon, the portions do not immediately reunite, or if the specific gravity be 1.26 when hot, or 1.31 when cold.

Off. Prep.—Mel boracis, *L. D. E.* Mel rosæ, *E. L.* Oxymel simplex, *L. E.* Oxymel colchici, *D.* Oxymel cupri subacetat. *D.* Oxymel scillæ, *D. L.* Conserva rutæ, *D. L.*

MEL SUBBORATIS SODÆ. *Ed.*

Honey of Borax.

Take of Subborate of soda, powdered, one part;
Clarified honey, eight parts;
Mix them.

MEL BORACIS. *Lond. Dub.*
Honey of Borax.

Take of Borax, powdered, one drachm;
Clarified honey, one ounce.
Mix.

THIS is much employed as a detergent in aphthæ and ulcers of the mouth.

MEL ROSÆ GALLICÆ. *Ed.*
Honey of Red Roses.

Take of Red rose leaves, dried, one ounce;
Boiling water, one pound;
Clarified honey, sixteen ounces;
Macerate the petals for six hours in the water, add the honey to the filtered liquor, and boil down to the proper thickness.

MEL ROSÆ. *Dub.*
Honey of Roses.

Take of The petals of red rose buds, previously dried, with the heels cut off, four ounces;
Boiling water, three pints;
Honey, five pounds.
Macerate the rose leaves in the water for six hours; then mix the honey with the strained liquor, and boil the mixture to the thickness of a syrup, removing the scum.

Lond.

Take of Red rose petals, dried, four ounces;
Boiling water, three pints;
Clarified honey, five pounds.
Macerate the petals in the water for six hours; then add the honey to the filtered liquor, and boil down to a proper consistence in a water-bath.

THE Dublin College, in making this and some similar preparations, use unclarified honey, with the idea, probably, that it may be equally well clarified in the course of the preparation itself. This is no doubt true; but as we do not know what effect the clarification may have on the active substances added to the honey, we think that the use of clarified honey as directed by the London College is preferable.

The formula of the Parisian Codex is considerably different, and has been justly criticised by the best pharmaceutists. It directs one pound of dried red rose leaves to be infused, for twelve hours, in four pounds of a decoction of their calyces; to filter without expression; to add to the liquor six pounds of best honey; to clarify it with white of egg, and boil down to a syrup. Here various faults are committed. The quantity of water is entirely absorbed by the petals, and no liquid is obtained without expression; the decoction of the calyces furnishes a great quantity of mucilage and resin, which render the clarification of the honey almost impracticable; or if enough of white of egg for that purpose be used, the whole astringency is removed. Henry recommends five parts of water to one of rose leaves, and to dissolve in the infusion, separated by expression, six parts of the finest honey; and, lastly, to skim it frequently while boiling down to the proper consistence. A very red and clear honey is obtained without any clarification.

Med. use.—This preparation is not unfrequently used in gargles for ulcerations and inflammation of the mouth and tonsils.

OXYMEL. *Dub.*

Oxymel *.

Take of Honey, two pounds;
Distilled vinegar, one pint.

Boil in a glass vessel, with a gentle fire, to the consistency of a syrup, skimming it.

Ed.

Take of Clarified honey, three parts;
Distilled vinegar, two parts;

Boil down in a glass vessel, with a gentle fire, to a proper thickness.

OXYMEL SIMPLEX. *Lond.*

Simple Oxymel.

Take of Clarified honey, two pounds;
Dilute acetic acid, one pint.

Boil down with a gentle fire, in a glass vessel, to the proper thickness.

THIS syrup is a favourite and useful domestic remedy in colds, and slight sore throats.

OXYMEL COLCHICI. *Dub.*

Oxymel of Meadow Saffron.

Take of The fresh bulb of meadow saffron, cut into thin slices, one ounce;
Distilled vinegar, one pint;
Clarified honey, two pounds, by weight.

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* *Syn. Oxymeloléš.*

Macerate the meadow saffron with the vinegar, in a glass vessel, for forty-eight hours. Strain the liquor, pressed out strongly from the root, and add the honey. Lastly, boil the mixture, frequently stirring it with a wooden spathula, to the thickness of a syrup.

THIS is an active preparation, but its use has been superseded by other preparations.

OXYMEL SCILLÆ. *Lond. Dub.*

Oxymel of Squills.

Take of Clarified honey, three pounds;
Vinegar of squills, two pints.

Boil them in a glass vessel, with a slow fire, to the thickness of a syrup, (the proper thickness, *Lond.*)

Med. use.—Oxymel of squills is a useful aperient, detergent, and expectorant, and of great service in humoral asthmas, coughs, and other disorders where thick phlegm abounds. It is given in doses of two or three drachms, along with some aromatic water, as that of cinnamon, to prevent the great nausea which it would otherwise be apt to excite. In large doses it proves emetic.

OXYMEL CUPRI SUBACETATIS. *Dub.*

Oxymel of Verdegris.

LINIMENTUM ÆRUGINIS. *Lond.*

Liniment of Verdegris.

Take of Prepared verdegris, one ounce;
Vinegar, seven ounces, by measure;
Clarified honey, fourteen ounces, by weight.

Dissolve the verdegris, in the vinegar, and strain it through linen; then add the honey, and boil the whole to a proper thickness.

Med. use.—This is the old *Mel Ægyptiacum*, and is a very useful stimulant and gentle escharotic. Externally it is applied, mixed with any digestive ointment, to destroy fungous flesh, and to excite unhealthy ulcers. It is a domestic remedy against suppurated chilblains. In ulcers of the lips, tongue and tonsils, resembling cancers, I have found it a very efficient application. When properly diluted with water, it may be used as a gargle in venereal ulcerations of the mouth and tonsils.

CHAP. XXIX.—EMULSIONS AND MIXTURES.

In this chapter we comprehend those compositions in which oils, and other substances, insoluble in water, are mixed with, and suspended in watery fluids, by means of viscid substances, such as mucilage and syrups.

MISTURA AMYGDALARUM. *Lond.*
Almond Mixture.

Take of Almond confection, two ounces;
Distilled water, one pint.

Triturate the confection with the water gradually added to it, until they mix; then strain.

Dub.

Take of Sweet almonds, blanched, an ounce and a half;
Bitter almonds, two scruples;
Refined sugar, half an ounce;
Water, two pints and a half.

Triturate the almonds with the sugar, adding the water by degrees, and strain.

EMULSIO AMYGDALI COMMUNIS. *Ed.*
Almond Emulsion.

Take of Sweet almonds, one ounce;
Refined sugar, half an ounce;
Water, two pounds and a half.

Blanch the almonds by steeping them for a little in hot water, and peeling them; then beat them diligently with the sugar in a stone mortar, gradually pouring on the water, and strain the liquor.

EMULSIO ACACIÆ ARABICÆ. *Ed.*
Arabic Emulsion.

Take of Mucilage of gum arabic, two ounces;
Almonds, one ounce;
Refined sugar, half an ounce;
Water, two pounds and a half.

Blanch the almonds, by steeping them in hot water, and peeling them; then beat them diligently in a stone mortar, first with the sugar, and then with the mucilage, gradually adding the water afterwards; lastly, strain through linen.

EMULSIO ARABICA. *Dub.*
Arabic Emulsion.

Take of Gum arabic, in powder, two drachms;
Sweet almonds, blanched,
Refined sugar, each half an ounce;
Water, one pint.

Dissolve the gum in the warm water, and when it is almost cold, gradually pour it upon the almonds, previously well beaten with the sugar, and at the same time triturate them together so as to form an emulsion, and then filter.

ALL these emulsions may be considered as possessing nearly the same qualities. When made without addition, they may truly be considered as a vegetable milk, as they consist of a bland oil mixed with water, by means of vegetable albumen, and like milk they separate by rest. On standing for some days, the oily matter rises to the top, like thick cream. By heat the same decomposition is immediately effected, and with the addition of a little acid, such as cream of tartar, the albuminous curd may be separated, and an elegant almond whey prepared. The addition of the gum arabic in the compound emulsions renders them more viscid and demulcent.

Great care should be taken that the almonds have not become rancid by keeping, which not only renders the emulsion extremely unpleasant, a circumstance of great consequence in a medicine that requires to be taken in large quantities, but likewise gives it injurious qualities.

The blanching of the almonds, by infusing them in boiling water, alters them a little. The success of the preparation depends upon beating the almonds to a smooth pulp, and triturating them with each portion of the watery fluid, so as to form an uniform mixture before another portion be added. The use of the almond confection directed by the London College is very convenient. The propriety of adding bitter almonds to the almond mixture of the Dublin College is very doubtful. It will render it more agreeable to some, but hurtful to others.

Med. use.—These liquors are principally used for diluting and correcting acrimonious humours; particularly in heat of urine and stranguries, arising either from a natural acrimony of the fluids, or from the operation of cantharides, and other irritating medicines. In these cases, they are to be drunk frequently, to the quantity of half a pint or more at a time.

EMULSIO CAMPHORÆ. *Ed.*
Camphor Emulsion.

Take of Camphor, one scruple;
Sweet almonds,
Refined sugar, of each, half an ounce;
Water, a pound and a half.

Beat the blanched almonds in a stone mortar, with the camphor and sugar previously well rubbed together, gradually adding the water, and then strain.

MISTURA CAMPHORÆ. *Lond.*
Camphor Mixture.

Take of Camphor, half a drachm;
Rectified spirit, ten minims;
Water, one pint.

First triturate the camphor with the spirit, then with the water gradually poured upon it, and strain.

Dub.

Take of Camphor, one scruple;
Rectified spirit, ten drops;
Refined sugar, half an ounce;
Warm water, a pint.

First triturate the camphor with the spirit, then with the sugar, and lastly add the water during the trituration, and filter the mixture through bibulous paper.

MISTURA CAMPHORÆ CUM MAGNESIA. *Dub.*
Mixture of Camphor with Magnesia.

Take of Camphor, twelve grains;
Carbonate of magnesia, half a drachm;
Water, six ounces.

Triturate the camphor with the magnesia, adding the water gradually, and mix.

NONE of these mixtures is very permanent, as the camphor separates, and swims upon the surface in the course of a few days. Camphor is, however, best suspended by triturating it with magnesia, or with genuine wheat starch.

Med. use.—These mixtures are very convenient modes of exhibiting camphor, and may be given to the extent of a table spoonful every three or four hours in typhoid fevers.

MISTURA AMMONIACI. *Dub.*
Mixture of Ammoniac.

Take of Gum ammoniac, one drachm;
Pennyroyal water, eight ounces, by measure.

Rub the gum with the pennyroyal water, gradually poured on, until the mixture acquire a milky appearance, and filter through linen.

Lond.

Take of Ammoniac, two drachms;
Water, half a pint.

Triturate the ammoniac with the water, gradually added to it, until they are thoroughly mixed.

The ammoniac mixture is employed for attenuating tough phlegm, and promoting expectoration in humoral asthmas, coughs, and obstructions of the viscera. It may be given to the quantity of two spoonfuls twice a-day.

MISTURA ASSÆFŒTIDÆ. *Dub.*

Mixture of Assafœtida.

Take of Assafœtida, one drachm;
Pennyroyal water, eight ounces, by measure.

Triturate the assafœtida with the water, gradually added to it, until it form an emulsion.

Lond.

Take of Assafœtida, two drachms;
Water, half a pint.

Triturate the assafœtida with the water, gradually added to it, until they become thoroughly mixed.

The assafœtida emulsion answers the same purposes as assafœtida in substance, and on some occasions is a more convenient, though very disagreeable mode of exhibiting it.

MISTURA GUAIACI. *Lond.*

Guaiac Mixture.

Take of Guaiac gum resin, one drachm and a half;
Refined sugar, two drachms;
Mucilage of gum arabic, two fluidrachms;
Cinnamon water, eight fluidounces.

Triturate the guaiac with the sugar, then with the mucilage, and during the trituration with these, gradually add the cinnamon water.

Gum Arabic has a chemical action upon guaiac, by which it readily forms an emulsion with water, so that in this mixture it is combined, and not merely suspended by the viscidity given by the mucilage and sugar. This, therefore, is one of the best forms of exhibiting guaiac.

MISTURA MOSCHI. *Lond.*
Musk Mixture.

Take of Musk,
Gum arabic, powdered,
Refined sugar, of each one drachm;
Rose water, six fluidounces.
Rub the musk first with the sugar, then with the gum, and add the rose water by degrees.

UNLESS the musk be very thoroughly triturated with the sugar and gum before the addition of the water, it is said to separate soon. An ounce, or an ounce and a half, may be taken for a dose.

POTIO CARBONATIS CALCIS. *Ed.*
Potion of Carbonate of Lime.

Take of Prepared carbonate of lime, one ounce;
Refined sugar, half an ounce;
Mucilage of gum arabic, two ounces.
Triturate together, and then gradually add, of
Water, two pounds and a half;
Spirit of cinnamon, two ounces.

MISTURA CRETÆ. *Lond. Dub.*
Mixture of Chalk.

Take of Prepared chalk, half an ounce;
Refined sugar, three drachms;
(Gum arabic, powdered, half an ounce, *Lond.*;) (mucilage of gum arabic, one ounce, *Dub.*)
Water, one pint.
Mix (them by trituration, *Lond.*)

THIS is a very good form of exhibiting chalk, and is an useful remedy in diseases arising from, or accompanied with, acidity in the primæ viæ. It is frequently employed in diarrhœa proceeding from that cause. The mucilage not only serves to keep the chalk suspended, but also improves its virtues. Of this medicine a pound or more may be taken in the course of a day.

MISTURA CORNU USTI. *Lond.*
Mixture of Burnt Horn.

Take of Burnt and prepared hartshorn, two ounces;
Gum arabic, in powder, one ounce;
Water, three pints.
Boil, constantly stirring, down to two pints, and strain.

PREPARED hartshorn is phosphate of lime in a minute state of mechanical division. By boiling in a mucilaginous liquid, it is diffused and imperfectly suspended, but not a particle of it is dissolved. This is therefore an injudicious preparation; for phosphate of lime would be much more easily and effectually suspended by triturating it with a larger proportion of gum arabic, and adding the water gradually. But we believe that this preparation has no other action than that of a weak mucilage.

MISTURA FERRI COMPOSITA. *Lond. Dub.*
Compound Mixture of Iron.

Take of Myrrh in (fine, *Dub.*) powder, one drachm;
Subcarbonate of potass, twenty-five grains;
Rose water, seven fluidounces and a half;
Sulphate of iron, in powder, one scruple;
Spirit of nutmeg, half a fluidounce;
Refined sugar, a drachm.

(Triturate the myrrh with the subcarbonate of potass and the sugar; and during the trituration, add first the rose water and spirit of nutmeg, and lastly the sulphate of iron. Immediately put the mixture into a proper glass bottle, and keep it well corked, *Lond.*)

(Triturate the myrrh, spirit of nutmeg, and carbonate of potass together; and to these, during the trituration, add first the rose water with the sugar, and lastly the sulphate of iron. Immediately put the mixture into a proper glass bottle, and cork it up, *Dub.*)

THIS is Griffith's celebrated tonic myrrh mixture. The myrrh should be well dried and powdered in cold weather. In this mixture, it is rendered more soluble, by forming a kind of soap with the alkali; a saponaceous emulsion is next formed by the addition of the water, which is decomposed on the addition of the sulphate of iron. The alkali combines with the sulphuric acid, while the myrrh and protoxide of iron remain suspended in the mixture. It must be carefully preserved from the action of the air, which gradually converts the protoxide of iron into peroxide, and decomposes the whole mixture.

In a well corked phial it however keeps in the state of protoxide even for years.

Med. use.—It is an useful tonic in diseases of debility without inflammatory action, and may be given, in doses of an ounce or two, two or three times a-day, in chlorosis, anæmia, and chronic catarrh.

MISTURA FERRI AROMATICA. *Dub.*

Aromatic Mixture of Iron.

Take of Crown bark, in coarse powder, an ounce;
Colomba root, sliced, three drachms;
Cloves, bruised, two drachms;
Filings of iron, half an ounce.
Digest for three days, in a close vessel, with occasional agitation, with as much mint-water as will yield a mixture of twelve ounces after filtration; then add of
Compound tincture of cardamoms, three ounces;
Tincture of orange-peel, three drachms.

THIS appears to be a very unchemical composition. The iron cannot be dissolved except in as much as it previously oxidized and combined with the cinchonic or other acids of the vegetable substances. In this way it imparts a greenish black colour to the liquor. But the quantity of iron prescribed is greatly excessive, for its quantity seems scarcely diminished after the completion of the process.

Med. use.—It is recommended as a tonic in dyspepsia and diseases of debility, but it is a very weak chalybeate. It is given in doses of half an ounce to two ounces.

ENEMA CATHARTICUM. *Dub.*

Purging Clyster.

Take of Manna, one ounce.
Dissolve in ten ounces, by measure, of
Compound decoction of chamomile; then add of
Olive oil, one ounce;
Sulphate of magnesia, half an ounce.
Mix them.

Off. Prep.—Enema fœtidum, *D.*

ENEMA FŒTIDUM. *Dub.*

Fetid Clyster,

Is made by adding to the former two drachms of the tincture of assafœtida.

THESE are very useful extemporaneous preparations, and answer perfectly the purposes for which they are intended.

ENEMA TEREBINTHINÆ. *Dub.*

Turpentine Enema.

Take of Common turpentine, half an ounce;
The yolk of an egg.
Triturate together, and add gradually
Water, not exceeding 100°, ten ounces.

THIS is the common, and a good formula for a turpentine clyster, which is often given with success in cases of obstinate constipation, and when the uterine circulation is languid.

ENEMA OPII. *Dub.*
Opiate Enema.

Take of Tincture of opium, one drachm;
Tepid water, six ounces.
Mix.

THIS is the simplest possible form for an anodyne clyster, and may be administered in cases of diarrhœa from relaxation, to allay abdominal pains, in cases of irritable bladder, or painful menstruation, and even to procure sleep.

ACETICA.

CHAP. XXX.—MEDICATED VINEGARS *.

INFUSIONS of vegetable substances in dilute acetic acid are commonly called Medicated Vinegars. The action of the acid in this case may be considered as twofold.

1. It acts simply as water, in consequence of the great quantity of water which enters into its composition, and generally extracts every thing which water is capable of extracting.

2. It exerts its own peculiar action as an acid. In consequence of this it sometimes increases the solvent power of its watery portion, or dissolves substances which water alone is incapable of dissolving: In a few instances only it impedes the solution of substances which water alone would dissolve.

As vinegar, in itself sufficiently perishable, has its tendency to decomposition commonly increased by the solution in it of any vegetable matter, it should never be used as a menstruum, unless where it promotes the solution of the solvend, as in extracting the alcaloids, as morphia, veratria, scillitine, and in dissolving the volatile, and especially the empyreumatic oils, or where it coincides with the virtues of the solvend; but the dilute pyrolignic acid, which is now universally used, is not liable to the same objection.

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* According to the proposed nomenclature, medicinal vinegars are called *Oxéolés*. Distilled vinegar becomes an *oxéolat*, and this term, being admitted into pharmacy, would supersede those of acetous acid, weaker acetic acid, and acetic acid diluted with water, given successively to distilled vinegar, and would put an end to that ambiguity of names which always exists between distilled vinegar and concentrated acetic acid or radical vinegar.

ACIDUM ACETICUM AROMATICUM. *Ed.*
Aromatic Acetic Acid.

Take of Rosemary tops, dried,
Sage leaves, dried, each one ounce;
Lavender flowers, dried, half an ounce;
Cloves, bruised, half a drachm;
Weak acetic acid, two pounds.

Macerate for seven days, express the liquor, and filter it through paper.

THE *Vinaigre des quatre voleurs* was supposed to be a certain prophylactic against the contagion of plague and similar diseases, and this preparation was intended to be a mere simplification of the formula; but this is not admitted by the French pharmaceutists, who allege that some of the active ingredients are altogether omitted.

I subjoin the formula for the preparation of the *Acetum aromaticum alliatum* seu *antisepticum.* "Take of the dried summits of wormwood, *Artemisia Pontica,* rosemary, sage, *Mentha aquatica,* rue, lavender flowers, of each 64 parts; of garlic, sweet flag root, cinnamon bark, cloves, nutmeg, of each 8 parts; best red vinegar 4000 parts. Macerate in a well-closed matrass for fifteen days; strain, with strong expression, filter through paper, and add of camphor dissolved in a sufficient quantity of alcohol, of acetic acid, sp. gr. 1075, of each 16 parts; keep in a well-closed vessel. The proportion of the solvents to the vinegar is a little below one-eighth."

Med. use.—This is in fact a pleasant solution of essential oils in vinegar, which will have more effect in correcting bad smells, than in preventing fever.

ACIDUM ACETICUM CAMPHORATUM. *Dub.*
Camphorated Acetic Acid.

Take of Acetic acid, six ounces by measure;
Camphor, half an ounce;
Rectified spirit, a sufficient quantity.

Reduce the camphor to powder, by means of the spirit; then add the acid and dissolve.

Ed.

Take of Strong acetic acid, six ounces;
Camphor, half an ounce.

Triturate the camphor with a little alcohol; add it to the acid and dissolve.

The alcohol in this preparation is used merely to facilitate the reduction of the camphor to powder, and a few drops of it suffice. The whole camphor is dissolved; indeed, strong acetic acid is capable of dissolving even a larger proportion than is directed in the above formula.

Med. use.—This solution is a powerful remedy. Its vapour, snuffed up the nostrils, which is the only method of using it, is one of the most pungent stimuli we possess. It is so extremely volatile and corrosive, that it is difficult to preserve, except in glass phials, with ground glass stoppers, or in small gold boxes, such as are used for Henry's aromatic spirit of vinegar, for which it is in fact an officinal substitute.

ACETUM COLCHICI. *Lond. Dub.*
Vinegar of Meadow Saffron.

Take of Fresh root of meadow saffron, sliced, one ounce;
Dilute acetic acid, one pint;
Proof-spirit, one fluidounce.

Macerate the root with the acid, in a corked glass bottle, for three days; then express the liquor, and set it at rest that the fæces may subside; lastly, add the spirit to the defæcated liquor.

THIS contains acetate of veratria.

Med. use.—This was formerly considered to be powerfully diuretic. It is now given as an anodyne in gout and neuralgia, as the other preparations of colchicum.

ACETUM OPII. *Dub.*
Vinegar of Opium.

Take of Turkey opium, four ounces;
Distilled vinegar, one pound.

Triturate the opium into a pulp with a little of the vinegar, and then add the remainder of the vinegar. Macerate the mixture in a corked bottle for seven days with frequent agitation. Pour off the supernatant liquor, and, lastly, filter it.

THIS is a valuable and scientific addition to our preparations of opium. It is now ascertained that acetic acid is one of the best solvents of morphia, and it extracts it more completely and readily from crude opium than water does. The knowledge of this fact now explains the just celebrity of various secret or apparently unnecessary processes to which opium has been at different times subjected. The Laudanum of Abbé Rousseau, the Lancashire blackdrop, and Battley's sedative liquor, all probably owe their virtues to their containing acetate of morphia. The officinal preparation has the advantage of being easy, certain, and perfectly understood. It is stronger than the officinal tincture in the proportion of three to two, which must be attended to in prescription.

Med. use.—The same as that of opium or its tincture, and perhaps it is less liable to affect unpleasantly certain constitutions.

ACIDUM ACETICUM SCILLITICUM. *Ed.*

Vinegar of Squills.

Take of Dried squills, one ounce;
Weak acetic acid, fifteen ounces;
Stronger alcohol, an ounce and a half.

Macerate the squills in the acetic acid for seven days; then press out the liquor, to which add the alcohol; and when the fæces have subsided, pour off the clear liquor.

ACETUM SCILLÆ. *Lond.*

Vinegar of Squills.

Take of Squills, recently dried, one pound;
Dilute acetic acid, six pints;
Proof spirit, half a pint.

Macerate the squills with the vinegar in a covered glass vessel, with a gentle heat, for twenty-four hours; then express the liquor, and set it aside until the fæces subside. Lastly, to the decanted liquor, add the spirit.

Dub.

Take of Squills, recently dried, and sliced, half a pound;
Vinegar, three pints;
Proof spirit, four fluidounces.

Macerate the squills in the vinegar for seven days, in a glass vessel, frequently agitating it; then express the vinegar; to which, poured from the fæces after they have subsided, add the spirit.

Med. use.—Vinegar of squills is a medicine of great antiquity. It is frequently used, with great success, as a diuretic and expectorant. The dose of this medicine is from half a drachm to a drachm or two. It is most conveniently exhibited along with cinnamon, or other aromatic water, which prevents the nausea it would otherwise, even in small doses, be apt to occasion. In a larger dose it causes vomiting, and with this view it is sometimes given before beginning a course of the smaller doses.

CHAP. XXXI.—TINCTURES.

Lond. Ed.

Tinctures ought to be made in shut glass vessels, and often shaked during the preparation.

Dub.

The tinctures should be made in close vessels, and should be frequently shaked during their digestion.

The leaves of hemlock, foxglove and henbane should be collected when in flower, and where they grow spontaneously.

THE term Tincture has often been employed in a very vague sense. It is now commonly applied to solutions, made by infusion, maceration or digestion, in alcohol, or diluted alcohol. But it is also extended to solutions in ether, ethereal spirits, and spirit of ammonia. Even when a distilled spirit is the menstruum, it appears to me, that the preparation is to be considered as a tincture, unless it be again separated from the insoluble parts of the solvend by distillation, and therefore the *spiritus lavandulæ compositus* is strictly a tincture; whereas, whenever distillation is employed to effect the union, it is no longer a tincture, but a distilled spirit, and therefore the *tinctura assafœtidæ ammoniata* is properly a distilled spirit.

According to M. Chereau, and he has been followed by the best French pharmaceutists, the term *tincture* ought to be abandoned. Strictly it means a *liquor prepared for dyeing*, and this certainly is not the object of our medicinal tinctures; recourse should therefore be had to that much more simple and real term *alcoholé*. On the same principle, the term *éthérolé* should be given to ethereal tinctures, which contain also resin and caoutchouc, as the *éthérolés* of castor, of arnica, &c. Thus it is easy to distinguish tinctures of the same substance made with alcohol and ether.

Alcohol is used as a menstruum, 1. When the solvend is not soluble, or is only sparingly soluble in water; 2. When a watery solution of the solvend is extremely perishable; 3. When the use of alcohol is indicated as well as that of the solvend.

Alcohol is capable of dissolving resins, gum-resins, extractive, tannine, sugar, volatile oils, soaps, camphor, adipocere, colouring matters, acids, alkalies, both simple and organic, and some compound salts. Many of these, as the gum-resins, soaps, extractive, tannine, sugar, and saline substances, are also soluble in water, while water is capable of dissolving substances insoluble in alcohol, such as gum, starch, gelatine, and many compound salts. The insolubility of these substances, however, in the different menstrua, is not absolute, but merely relative; for a certain proportion of alcohol may be added to a solution of gum in water without decomposing it; and a solution of resin in alcohol will bear a certain admixture of water without becoming turbid. Therefore diluted alcohol, which is a mixture of these two solvents, sometimes extracts the virtues of heterogeneous compounds more completely than either of them separately, and is commonly employed unless when the solution requires rectified spirit to render it perfect. By these principles the strength of the spirit to be used must be determined. The French pharmaceutists prescribe alcohol at 847 for resinous substances, at 868 for resinous extracts, and at 923 for what are called extractive principles. The practice of the British Colleges is not uniform. Alcohol stronger than rectified spirit is used only in making Tinct. acet. ferri cum alcohol. *D.* Rectified spirit is employed for Tinct. assæf. *E. L.*, T. bals. Tolut., T. benz., T. camph., T. castorei, *E. L.*, Guaiaci, T. iodinii, T. kino, *L. D.*, T. moschi, T. myrrhæ, *L.*, T. saponis, T. saponis et opii, T. zingib., *L.* A spirit weaker than rectified spirit, but stronger than proof spirit, is used for Tinct. assafœt. *D.*, T. myrrh. *E. D.*, and T. aloes et myrr. *E. D.* A spirit weaker than proof spirit is prescribed for Tinct. aloes by all the colleges, and for Tinct. rhæi comp. *L.* All other tinctures are made with a spirit corresponding nearly to proof spirit in strength.

In making alcoholic tinctures, we must observe that the virtues of vegetable matters are less perfectly extracted by spiritous menstrua when recent than when previously carefully dried. As we cannot assist the solution by means of much heat, we must facilitate it by the mechanical division of the solvend. A coarse powder often answers best, as, when too minute, it is apt to settle and agglutinate. When a tincture is compound, and contains several ingredients, it is proper to add them successively to the spirit, beginning with those which are least soluble and ending with those most soluble; because otherwise the solvent would get saturated by the most soluble, and would not act on the others.

To prevent loss, the solution is commonly made in a close vessel; but the heat applied must be very gentle, lest the vessel be broken by the expansion of vapour.

The Colleges order digestion between 90° and 100°, or employ maceration from 60° to 90°.

The length of time during which the maceration is to be continued is generally seven days by the Edinburgh and Dublin Colleges, and fourteen by the London.

Tinctures are not liable to spoil, but they must nevertheless be kept in well-closed phials, especially when they contain active ingredients, to prevent the evaporation of the menstruum.

Tinctures have been divided by the French pharmaceutists, into 1st, simple; 2d, sweetened; 3d, acid; 4th, ammoniacal; 5th, metallic.

The action of tinctures on the living system is always compounded of the action of the menstruum, and of the matters dissolved in it. Now, these actions may either coincide with, or oppose each other; and as alcohol is at all times a powerful agent, it is evident that no substance should be exhibited in the form of a tincture, whose action is different from that of alcohol, unless it be capable of operating in so small a dose that the quantity of alcohol taken along with it is inconsiderable.

They generally operate in doses so small, that they are rarely exhibited by themselves, but commonly combined with some vehicle which ought not to decompose the tincture, or at least not separate any thing from it in a palpable form.

TINCTURA ALOES SOCOTORINÆ. *Ed.*
Tincture of Socotorine Aloes.

Take of Socotorine aloes, in powder, half an ounce;
Extract of liquorice, an ounce and a half;
Stronger alcohol, four ounces;
Water, one pound.
Digest for seven days, and pour off the depurated tincture.

TINCTURA ALOES. *Dub.*
Tincture of Aloes.

Take of Socotorine aloes, powdered, half an ounce;
Extract of liquorice, dissolved in eight ounces of boiling water, an ounce and a half;
Proof-spirit, eight ounces by measure.
Digest for seven days, then strain.

Lond.

Take of Extract of spiked aloes, in powder, half an ounce;
Extract of liquorice, one ounce and a half;

Water, a pint;
Rectified spirit, four fluidounces.
Macerate for fourteen days, then strain.

This is one of the simplest and best of the aloëtic tinctures. The Colleges employ an alcohol weaker than proof spirit, to render it less stimulant. The liquorice is added to cover the taste of the aloes, and to assist in suspending it in the fluid. About an ounce may be taken for a dose.

TINCTURA ALOES ET MYRRHÆ. *Ed.*

Tincture of Aloes and Myrrh.

Take of Myrrh, in powder, two ounces;
Stronger alcohol, one pound and a half;
Water, half a pound.
Mix the alcohol with the water, then add the myrrh; digest for four days; and, lastly, add
Socotorine aloes, in powder, one ounce and a half;
Saffron, cut in pieces, one ounce.
Digest again for three days, and pour off the tincture from the sediment.

TINCTURA ALOES COMPOSITA. *Lond Dub.*

Compound Tincture of Aloes.

Take of Socotorine aloes, in powder, three ounces;
(Saffron, three ounces, *Lond.*)
Tincture of myrrh, two pints.
Macerate for a fortnight, and strain.

This is supposed to be an improvement on the *Elixir proprietatis* of Paracelsus. The two formulæ differ however in strength; the *Lond.* and *Dub.* contains about one part of aloes to ten of the menstruum, the *Ed.* one to twelve, while the preceding simple tincture contains but one to thirty-two. It is also necessary to point out the difference in strength of the alcohol employed, especially by the London and Dublin Colleges, as they apparently use the same menstruum. But the tincture of myrrh of London is made with rectified spirit, and that of Dublin with rectified spirit diluted with one-third of its weight of water, corresponding in this respect to the Edinburgh formula. In prescription these proportions must be attended to. The myrrh and saffron may add to the stimulating properties of the tincture.

TINCTURA ASSAFŒTIDÆ. *Lond.*
Tincture of Assafœtida.

Take of Assafœtida, four ounces;
Rectified spirit, two pints.
Macerate for a fortnight, and filter.

Dub.

Take of Assafœtida, four ounces;
Rectified spirit of wine, two pints;
Water, eight ounces by measure.
Add the spirit to the assafœtida, triturated with the water; macerate for seven days; then strain.

TINCTURA FERULÆ ASSÆ FŒTIDÆ. *Ed.*
Tincture of Assafœtida.

Take of Assafœtida, four ounces;
Stronger alcohol, two pounds and a half.
Digest for seven days, and strain through paper.

THIS tincture possesses the virtues of the assafœtida, and may be given in doses of from ten drops to fifty or sixty.

Off. Prep.—Enema fœtid. *D.*

TINCTURA ANGUSTURÆ. *Dub.*
TINCTURA BONPLANDIÆ TRIFOLIATÆ. *Ed.*
Tincture of Angustura.

Take of Angustura bark, in coarse powder, two ounces;
Proof-spirit of wine, two pints.
Digest for seven days, (macerate for fourteen, *Dub.*) and filter.

ANGUSTURA bark readily gives out its active principles to alcohol; hence the tincture is a convenient and useful mode of exhibiting it.

TINCTURA AURANTII. *Lond.*
Tincture of Orange-peel.

Take of Fresh orange-peel, three ounces;
Proof-spirit, two pints.
Macerate for fourteen days, and strain.

THIS tincture is an agreeable bitter, flavoured at the same time with the essential oil of the orange-peel. It has been omitted by an oversight in the last edition of the Dublin Pharmacopœia, for it is prescribed in an officinal composition.

Off. Prep.—Mistura ferri aromatica, *D.*

TINCTURA BENZOINI COMPOSITA. *Ed.*

Compound Tincture of Benzoin.

Take of Benzoin, in powder, three ounces;
Balsam of Tolu, two ounces;
Socotorine aloes, in powder, half an ounce;
Stronger alcohol, two pounds.

Digest for seven days, and strain through paper.

TINCT. BENZOINI COMP. *Lond.* TINCT. BENZOËS COMP. *Dub.*

Compound Tincture of Benzoin.

Take of Benzoin, three ounces;
Purified storax, two ounces;
Balsam of Tolu, one ounce;
Socotorine aloes, half an ounce;
Rectified spirit of wine, two pints.

Digest for seven days, (macerate for fourteen days, *Lond.*), and filter.

THESE preparations may be considered as simplifications of some very complicated compositions, which were celebrated under different names; such as *Baume de Commandeur*, Wade's balsam, Friars balsam, Jesuits drops, &c.

TINCTURA BALSAMI TOLUTANI. *Dub.*

Tincture of Balsam of Tolu.

Take of Balsam of Tolu, one ounce;
Rectified spirit, one pint.

Digest in a close vessel until the balsam be dissolved, and filter.

TINCTURA TOLUIFERI BALSAMI. *Ed.*

Tincture of Balsam of Tolu.

Take of Balsam of Tolu, an ounce and a half;
Stronger alcohol, one pound.

Digest until the balsam be dissolved; and strain the tincture through paper.

THIS solution of balsam of Tolu possesses all the virtues of the balsam itself. It may be taken internally, with the several intentions for which that balsam is proper, to the quantity of a tea-spoonful or two, in any convenient vehicle. Mixed with simple syrup, it forms an elegant balsamic syrup.

Off. Prep.—Syrupus balsami Tolutani, *D. E.*

TINCTURA BUCHU. *Dub. Ed.*

Tincture of Buchu.

Take of Buchu leaves, two ounces;
Proof-spirit, one pint.

Macerate for seven days, then filter.

This tincture has a dark colour, and a strong smell.

Med. use.—It is stimulant, and hence acts as a diaphoretic. It also exerts considerable power over the urinary organs. It is prescribed either alone in doses of ʒ i. to ʒ iv. or added to infusion of Buchu as a diuretic, and in cases of chronic mucous discharge from the bladder.

TINCTURA CAMPHORÆ. *Ed.*

Tincture of Camphor.

Take of Camphor, one ounce;
Stronger alcohol, one pound.

Mix them together, that the camphor may be dissolved.

It may also be made with a double, or triple proportion of camphor.

SPIRITUS CAMPHORÆ. *Lond.*

Spirit of Camphor.

Take of Camphor, four ounces;
Rectified spirit, two pints.

Mix so as to dissolve the camphor.

TINCTURA CAMPHORÆ, sive SPIRITUS CAMPHORATUS. *Dub.*

Tincture of Camphor, or Camphorated Spirit.

Take of Camphor, one ounce;
Rectified spirit of wine, eight ounces, by measure.

Mix so as to dissolve the camphor.

Med. use.—Tincture of camphor is only employed externally, against rheumatic pains, paralytic numbness, chronic inflammation, for discussing tumours, and preventing gangrene, or restraining its progress.

TINCTURA CANTHARIDIS VESICATORIÆ. *Ed.*

Tincture of Cantharides.

Take of Cantharides, bruised, one drachm;
Weaker alcohol, one pound.

Digest for seven days, and strain through paper.

TINCTURA CANTHARIDES. *Dub.*

Tincture of Spanish Flies.

Take of Cantharides, in powder, two drachms;
Proof-spirit, one pint and a half.

Digest for seven days, and strain.

Lond.

Take of Cantharides, bruised, three drachms;
Proof-spirit, two pints.
Macerate for fourteen days, and strain.

This tincture contains the active principle of the cantharides. Their strength as to the proportion of cantharides is different, being nearly as 96, 86 and 76. Although all the British Colleges prescribe weak spirit, rectified spirit would be preferable, as the active principle, *Cantharidine*, is more soluble in alcohol than in water.

Med. use.—It is applied externally as a stimulant and rubefacient, and is sometimes given internally, in doses of from ten to twenty drops, as a diuretic, or as a stimulant in gleets and gonorrhœa.

Sanchez, physician to the Empress of Russia, has left the following formula for the cure of gleet: Take of pulverized cantharides ʒij., rectified alcohol ℔iss. Allow it to digest for two days, strain; add to the filtered solution balsam of copaiva ℥iss., cochineal ʒi.; set it again to digest for four days, and filter for use. It is given in the dose of from 12 to 15 drops in a mucilaginous drink of barley or marshmallow, sufficiently thick. The dose is afterwards to be augmented to 20, 24, and 36 drops, (ʒss.)

TINCTURA CARDAMOMI. *Lond.*

Tincture of Cardamom.

Take of Lesser cardamom seeds, bruised, three ounces;
Proof-spirit, two pints.
Macerate for fourteen days, and strain.

TINCTURA AMOMI REPENTIS. *Ed.*

Tincture of Cardamom.

Take of Lesser cardamom seeds, bruised, four ounces;
Weaker alcohol, two pounds and a half.
Digest for seven days, and filter through paper.

Med. use.—Tincture of Cardamoms has been in use for a considerable time. It is a pleasant warm cordial; and may be taken, along with any proper vehicle, in doses of from a drachm to a spoonful or two.

TINCTURA CARDAMOMI COMPOSITA. *Dub.*

Compound Tincture of Cardamom.

Take of Lesser cardamom seeds, husked and bruised,
Caraway seeds, powdered, of each two drachms;
Cinnamon bark, bruised, half an ounce;
Proof-spirit, two pints.

Macerate for fourteen days, and strain.

Lond.

Take of Cardamom seeds,
Caraway seeds,
Cochineal, of each, powdered, two drachms;
Cinnamon-bark, bruised, half an ounce;
Raisins, stoned, four ounces;
Proof-spirit, two pints.
Macerate for fourteen days, and strain.

THIS tincture is an agreeable aromatic, somewhat less stimulant than the compound tincture of cinnamon, which, besides a large proportion of aromatics, contains also long pepper. The compound tincture of the London College is sweetened; that of the Dublin not, which sometimes leads patients who pass from the one kingdom to the other to suspect that the medicine is not rightly prepared.

TINCTURA CASCARILLÆ. *Lond. Dub.*
TINCTURA CROTONIS ELEUTHERIÆ. *Ed.*
Tincture of Cascarilla.

Take of The bark of cascarilla, powdered, (in coarse powder, *Dub.*,) four ounces;
Proof-spirit, two pints, (two pounds and a half, *Ed.*)
Macerate for seven days, (fourteen, *Lond.*), and strain.

THE proportion of alcohol is here so large, as indeed it is in most of the tinctures of this kind, that it is merely to be considered as a concealed dram.

TINCTURA CASTOREI. *Lond.*
Tincture of Castor.

Take of Castor, powdered, two ounces;
Rectified spirit, two pints.
Macerate for seven days, and strain.

Ed.

Take of Castor, in powder, an ounce and a half;
Stronger alcohol, one pound.
Digest for seven days, and strain through paper.

TINCTURA CASTOREI ROSSICI. *Dub.*
Tincture of Russian Castor.

Take of Russian castor, in powder, two ounces;
Proof-spirit, two pints.

Macerate for seven days, then filter.

THE London College agrees with that of Edinburgh in ordering this tincture to be made with rectified spirit, but it uses a larger proportion of castor. The Dublin still uses weak spirit.

Med. use.—The tincture of castor is recommended in most kinds of nervous complaints and hysteric disorders: in the latter, it sometimes does service, though many have complained of its proving ineffectual. The dose is from twenty drops to forty, fifty, or more.

TINCTURA CAPSICI. *Lond. Dub.*

Tincture of Capsicum.

Take of Capsicum pods, one ounce;
Proof-spirit, two pints.
Macerate for fourteen days, and filter.

THIS is a very powerful acrid stimulant. It is used with effect as a gargle in gangrenous and relaxed sore throats.

TINCTURA CATECHU. *Lond. Dub.*

Tincture of Catechu.

Take of Extract of catechu, three ounces;
Cinnamon, bruised, two ounces;
Proof-spirit, two pints.
Macerate for seven days, (fourteen *Lond.*), and filter.

TINCTURA ACACIÆ CATECHU. *Ed.*

Tincture of Catechu.

Take of Extract of catechu, three ounces;
Cinnamon bruised, two ounces;
Weaker alcohol, two pounds and a half.
Digest for seven days, and strain through paper.

THE cinnamon both covers the taste of the catechu, and coincides with its effect.

Med. use.—This tincture is of service in all kinds of discharges, mucous or sanguinolent, catarrhs, looseness, uterine fluxes, and other disorders, where astringent medicines are indicated. Two or three tea-spoonfuls may be taken every now and then in red wine, or any other vehicle.

TINCTURA CINCHONÆ LANCIFOLIÆ. *Ed.*

Tincture of Cinchona.

Take of Cinchona bark, in powder, four ounces;
Weaker alcohol, two pounds and a half.
Digest for seven days, and filter through paper.

TINCTURA CINCHONÆ. *Dub.*

Tincture of Cinchona.

Take of Crown bark, in coarse powder, four ounces;
Proof-spirit, two pints.
Digest for seven days, and strain.

Lond.

Take of Lance-leaved cinchona bark, in powder, seven ounces;
Proof-spirit, two pints.
Macerate for fourteen days, and filter.

THIS tincture is certainly impregnated with the virtues of cinchona, but not to such a degree that it can be given in sufficient doses to produce the specific effects of cinchona, without exhibiting more alcohol than what is proper to be given as a medicine. That of the London College is the best, as containing most bark.

TINCTURA CINCHONÆ COMPOSITA. *Lond. Ed.*

Compound Tincture of Cinchona.

Take of Peruvian bark, powdered, two ounces;
Orange-peel, dried, one ounce and a half;
Virginian snake-root, bruised, three drachms;
Saffron, one drachm;
Cochineal, powdered, two scruples;
Proof-spirit, twenty fluidounces, *Lond.* (twenty ounces, *Ed.*)
Digest for seven days, and filter through paper, *Ed.* Macerate for fourteen days, and filter, *Lond.*

Dub.

Take of Crown bark, in coarse powder, two ounces;
Orange-peel, dried, half an ounce;
Snake-root, bruised, three drachms;
Saffron,
Cochineal, in powder, of each two scruples;
Proof-spirit, twenty ounces.
Macerate for fourteen days, and filter.

THIS is a modification of the celebrated *Huxham's Tincture of Bark.*

Med. use.—As a corroborant and stomachic, it is given in doses of two or three drachms; but when employed for the cure of intermittents, it must be taken to a greater extent.

TINCTURA CINNAMOMI. *Lond. Dub.*

Tincture of Cinnamon.

Take of Cinnamon, bruised, three ounces, *Lond.* (three ounces and a half, *Dub.*);
Proof-spirit of wine, two pints.
Macerate for fourteen days, and strain.

TINCTURA LAURI CINNAMOMI. *Ed.*

Tincture of Cinnamon.

Take of Cinnamon, bruised, three ounces;
Weaker alcohol, two pounds and a half.
Digest for seven days, and strain through paper.

THE tincture of cinnamon possesses the astringent as well as the aromatic cordial virtues of the cinnamon; and in this respect it differs from the spirit prepared by distillation.

TINCTURA CINNAMOMI COMPOSITA. *Ed.*

Compound Tincture of Cinnamon.

Take of Cinnamon bark, bruised,
Lesser cardamom seeds, bruised, each one ounce;
Long pepper, in powder, two drachms;
Weaker alcohol, two pounds and a half.
Digest for seven days, and filter through paper.

Lond.

Take of Cinnamon, bruised, six drachms;
Lesser cardamom seeds, husked and bruised, three drachms;
Long pepper, in powder,
Ginger, sliced, of each two drachms;
Proof-spirit, two pints.
Mix and macerate for fourteen days, then strain.

IN their formula the London College has a smaller quantity of cardamom seeds, and substitutes for it a proportion of ginger. This makes no alteration in the virtues of the preparation, which is a very warm aromatic. A tea-spoonful or two may be taken in wine, or any other convenient vehicle, in languor, weakness of the stomach, flatulencies, and other similar complaints; and in these cases it is often employed with advantage.

TINCTURA SEMINUM COLCHICI. *Dub.*

Tincture of Meadow Saffron Seeds.

Take of Meadow saffron seeds, two ounces;
Proof-spirit, one pound.

Macerate for fourteen days, and filter.

The ripe seeds of meadow saffron are much more uniform in their properties than the roots, which are at one season almost inert, at another very active. This tincture is therefore a judicious preparation, which may be given in doses of about half an ounce, to relieve the pain of gout and neuralgia.

TINCTURA COLOMBÆ. *Ed.*
Tincture of Colombo.

Take of Colombo root, powdered, two ounces;
Proof-spirit of wine, two pints.
Digest for seven days, and filter through paper.

TINCTURA CALUMBÆ. *Lond.* TINCTURA COLOMBÆ. *Dub.*
Tincture of Colomba.

Take of Colomba root, sliced, two ounces and a half;
Proof-spirit, two pints.
Macerate for fourteen days, and strain.

This is a very good stomachic tincture, which may be used when the stomach will not bear the colomba in powder.

TINCTURA CONII MACULATI. *Ed.* TINCTURA CONII. *Dub.*
Tincture of Hemlock.

Take of Hemlock leaves, dried, two ounces;
Lesser cardamom seeds, bruised, half an ounce, (an ounce, *Dub.*);
Weaker alcohol, sixteen ounces, (a pint, *Dub.*)
Digest for seven days, and filter (through paper, *Ed.*)

This is now prescribed as another anodyne tincture. There is some advantage in having a variety of these, as the idiosyncrasies in respect to them are often very singular. We have no experience of its powers.

TINCTURA CROCI SATIVI. *Ed.*
Tincture of Saffron.

Take of Saffron, cut in shreds, one ounce;
Diluted alcohol, fifteen ounces.
Digest for seven days, and strain through paper.

The proof-spirit is a very proper menstruum for extracting the medical virtues of the saffron, and affords a convenient mode of exhibiting that drug.

TINCTURA PIPERIS CUBEBÆ. *Dub.*
Tincture of Cubebs.

Take of Cubebs, four ounces;
Proof-spirit, two pints.
Macerate for fourteen days, and filter.

THIS is a warm aromatic, and is recommended as a diuretic in gonorrhœa and gleet. It is also an excellent carminative.

TINCTURA DIGITALIS PURPUREÆ. *Ed.*
Tincture of Foxglove.

Take of The dried leaves of foxglove, one ounce;
Weaker alcohol, eight ounces.
Digest for seven days, and strain through paper.

TINCTURA DIGITALIS. *Dub.*
Tincture of Foxglove.

Take of The leaves of foxglove, (rejecting the larger ones,) dried, and in coarse powder, two ounces;
Proof-spirit, one pint.
Macerate for seven days, and filter.

Lond.

Take of Leaves of foxglove, dried, four ounces;
Proof-spirit, two pints.
Macerate for fourteen days, and filter.

Med. use.—This tincture is a very powerful medicine, and contains the virtues of the foxglove in a very manageable form. It has been much used to diminish the force of the circulation of the blood in hæmoptysis, especially from hypertrophy of the heart, and often with remarkable success. It has been also said to cure incipient phthisis pulmonalis; but subsequent experience has not confirmed the first reports. It is very frequently given as a diuretic in dropsies. Like every other form in which foxglove is given, it should be administered in very small doses at first, such as from ten to twenty drops, and cautiously increased.

TINCTURA GALBANI. *Dub.*
Tincture of Galbanum.

Take of Galbanum, cut into small pieces, two ounces;
Proof-spirit of wine, two pints.
Digest for seven days, and strain.

THIS tincture, though not so powerful, is less nauseous than that of assafœtida, and therefore in some cases may be preferable.

TINCTURA GALLARUM. *Dub. Ed.*
Tincture of Galls.

Take of Galls, in powder, four ounces, (two ounces, *Ed.*);
Proof-spirit, two pints, (sixteen ounces, *Ed.*)
Mix; digest for seven days, and filter.

THIS tincture was for the first time introduced into practice by the Dublin College. It is a very powerful astringent.

TINCTURA GENTIANÆ COMPOSITA. *Ed.*
Compound Tincture of Gentian.

Take of Gentian root, sliced and bruised, two ounces;
Seville orange peel, dried and bruised, one ounce;
Canella alba, bruised, half an ounce;
Cochineal, in powder, half a drachm;
Weaker alcohol, two pounds and a half.
Macerate for seven days, and strain through paper.

Dub. Lond.

Take of Gentian root, sliced and bruised, two ounces;
Dried rind of Seville oranges, one ounce;
Lesser cardamom seeds, husked and bruised, half an ounce;
Proof-spirit of wine, two pints.
Macerate for fourteen days, and strain.

THESE are very elegant spiritous bitters. The first is coloured red, the other not. It is also hotter.

TINCTURA GUAIACI OFFICINALIS. *Ed.*
Tincture of Guaiac.

Take of Guaiac resin, in powder, six ounces;
Stronger alcohol, two pounds and a half.
Digest for seven days, and strain through paper.

TINCTURA GUAIACI. *Dub.*
Tincture of Guaiac.

Take of Guaiac, four ounces;
Rectified spirit of wine, two pints.
Macerate for seven days, and filter.

Lond.

Take of Guaiac gum resin, in powder, half a pound;
Rectified spirit, two pints.

Macerate for fourteen days, and filter.

What is called gum guaiac is in fact a resin, and perfectly soluble in alcohol. This solution is a powerful stimulating sudorific, and may be given in doses of about half an ounce, in rheumatic and arthritic cases. It was once supposed to be a specific against the gout.

TINCTURA HELLEBORI NIGRI. *Dub. Lond.*

Tincture of Black Hellebore.

Take of Black hellebore root, sliced, four ounces;
Proof-spirit, two pints.
Macerate for fourteen days, (digest for seven, *Dub.*), and filter.

Ed.

Take of Black hellebore root, bruised, two ounces;
Cochineal, in powder, fifteen grains;
Weaker alcohol, fifteen ounces.
Digest for seven days, and filter through paper.

This is perhaps the best preparation of hellebore, when designed for an alterative. It has been found particularly serviceable in uterine obstructions. In sanguine constitutions, where chalybeates are hurtful, it has been said that it seldom fails of exciting the menstrual evacuation, and removing the bad effects of its suppression. A tea-spoonful of the tincture may be taken twice a-day in warm water, or any other convenient vehicle.

TINCTURA HUMULI. *Lond.* TINCTURA HUMULI LUPULI. *Ed. Dub.*

Tincture of Hops.

Take of Hops, five ounces;
Proof-spirit, two pints, (two pounds and a half, *Ed.*)
Macerate for fourteen days, with frequent agitation, *Dub.*, (seven days, *Ed.*), and filter.

Med. use.—Opium in every form disagrees so much with some people, as to render its exhibition to them improper. In these cases we must have recourse to other narcotics, and of these the hop is one of the safest and most agreeable. Its comparative strength is not yet well ascertained, nor even the best form of exhibiting it.

In their natural form hops are so extremely light and bulky, as to absorb and retain a great deal of the spirit employed to extract a tincture from it, even when subjected to much compression. But when it is thoroughly dried, it may be rubbed between the hands to a sufficiently fine powder, from which the tincture may be prepared without much loss.

TINCTURA HYOSCIAMI NIGRI. *Ed.*
Tincture of Henbane.

Take of The leaves of henbane, dried, one ounce;
Weaker alcohol, eight ounces.
Digest for seven days, and strain through paper.

TINCTURA HYOSCIAMI. *Dub.*
Tincture of Henbane.

Take of Henbane leaves, dried, five ounces and a quarter;
Proof-spirit, two pints.
Macerate for seven days, and strain.

Lond.

Take of Henbane leaves, dried, four ounces;
Proof-spirit, two pints.
Macerate for fourteen days, and filter.

Med. use.—This tincture, now come into very general use, is a valuable anodyne, and in many cases may be substituted with advantage for the tincture of opium, especially where the latter produces obstinate constipation, or, instead of its usual soporific and sedative effects, causes uneasiness, restlessness, and universal irritation.

An anonymous correspondent observes, that it is useful in recent coughs, in doses to an adult of not less than thirty drops, with ten drops of laudanum. Tincture of henbane alone sometimes purges; when this is an inconvenience, it is corrected by the addition of a few drops of laudanum.

TINCTURA IODINII. *Dub.*
Tincture of Iodine.

Take of Iodine, two scruples;
Rectified spirit, one ounce.
Mix and dissolve the iodine by the assistance of heat. Keep the mixture in a closely stopped phial.

In this preparation the rectified spirit is saturated with iodine, according to the original prescription of Dr Coindet, which has been often prepared with too much iodine, in consequence of not attending to the circumstance, that the Geneva ounce contains 576 grains, and not 480, as the ounce of this and other countries. It has a deep brown colour, the peculiar smell of iodine, and a disagreeable taste. Twenty drops are said to contain one grain of iodine.

Med. use.—The tincture is one of the most active forms of iodine that can be safely employed. It is given in doses of 10 drops three times a-day, gradually increased to 15 and even 20, beyond which Dr Coindet does not go. It is chiefly used in bronchocele and strumous swellings, and there is no remedy from which there is greater probability of advantage in internal tubercles, and new formations and depositions of coagulable lymph.

TINCTURA CONVOLVULI JALAPÆ. *Ed.*
Tincture of Jalap.

Take of Jalap, in powder, three ounces;
Weaker alcohol, fifteen ounces.
Digest for seven days, and strain the tincture through paper.

TINCTURA JALAPÆ. *Lond. Dub.*
Tincture of Jalap.

Take of Jalap, in powder, eight ounces;
Proof-spirit, two pints.
Macerate for fourteen days, and filter.

RECTIFIED spirit was formerly ordered for the preparation of this tincture; but proof-spirit is a preferable menstruum, as it dissolves the active constituents of the jalap equally well, and is less stimulating. The Dublin is the weakest, and the London the strongest of the three tinctures.

TINCTURA KINO. *Ed.*
Tincture of Kino.

Take of Kino in powder, two ounces;
Weaker alcohol, a pound and a half.
Digest for seven days, and strain through paper.

Lond. Dub.

Take of Kino, in powder, three ounces;
Rectified spirit, two pints.
Macerate for fourteen (seven, *Dub.*) days, and filter.

THIS is a very astringent tincture, and will be found an excellent medicine in obstinate diarrhœas, and in lienteria. Very different articles, I have already observed, are sold under the appellation of Kino, and with some of them the tincture turns out gelatinous. The London and Dublin Colleges use rectified spirit as the menstruum.

SPIRITUS LAVANDULÆ COMPOSITUS. *Ed.*
Compound Spirit of Lavender.

Take of Spirit of lavender, three pounds;

Spirit of rosemary, one pound;
Cinnamon bark, bruised, one ounce;
Cloves, bruised, two drachms;
Netmeg, bruised, half an ounce;
Red saunders wood, in shavings, three drachms.
Macerate for seven days, and filter.

Lond. Dub.

Take of Spirit of lavender, three pints;
Spirit of rosemary, one pint;
Cinnamon bark, bruised,
Nutmegs, bruised, of each half an ounce;
(Cloves, two drachms, *Dub.*)
Red saunders wood, sliced, one ounce.
Digest for ten days, (macerate for fourteen days, *Lond.*), and strain.

Although the spirit of lavender be the predominant ingredient, yet the mode of preparation is that of a tincture, and the spirit as a menstruum dissolves astringent, colouring, and other substances, which would not rise with it in distillation.

Med. use.—These preparations do not differ materially. They are grateful cordials, of which from ten to a hundred drops may be conveniently taken, dropt upon sugar.

Off. Prep.—Liquor arsenicalis, *D. E. L.* Aqua laurocerasi, *D.*

TINCTURA MOSCHI. *Dub.*
Tincture of Musk.

Take of Musk, in powder, two drachms;
Rectified spirit of wine, one pint.
Digest for seven days, and strain.

Rectified spirit is the most complete menstruum for musk; but in this form it is often impossible to give a sufficient quantity of the musk.

TINCTURA MYRRHÆ. *Ed.*
Tincture of Myrrh.

Take of Myrrh, in powder, three ounces;
Stronger alcohol, twenty ounces;
Water, ten ounces.
Digest for seven days, and strain through paper.

Lond.

Take of Myrrh, bruised, four ounces;
Rectified spirit, three pints;
Macerate for fourteen days, and strain.

Dub.

Take of Myrrh, bruised, three ounces;
Proof-spirit of wine, a pint and a half;
Rectified spirit of wine, half a pint.
Digest for seven days and filter.

It is esteemed a great perfection in tincture of myrrh to be perfectly transparent, which can only be attained by using rectified spirit and select myrrh. The formulas of the Edinburgh and Dublin Colleges are in this respect faulty.

Med. use.—Tincture of myrrh is recommended internally as a cardiac, for removing obstructions, particularly those of the uterine vessels, and for resisting putrefaction. The dose is from fifteen drops to forty or more. The medicine may perhaps be given in these cases to advantage; though, with us, it is more commonly used externally, for cleansing foul ulcers, and promoting the exfoliation of carious bones.

Off. Prep.—Tinct. aloes comp. *D. L.*

TINCTURA NUCIS VOMICÆ. *Dub.*

Tincture of Nux Vomica.

Take of Nux vomica, rasped, two ounces;
Rectified spirit, eight ounces.
Macerate for seven days, then filter.

The peculiar effects of strychnia are now well ascertained, as observed not only in the pure principle prepared by chemical art, but also in the extract obtained by evaporating the tincture. But I should doubt whether the tincture itself be a judicious preparation, both on account of the very small proportion of strychnia contained in it, and on account of its intense bitterness, which will prevent its being exhibited in sufficient doses.

TINCTURA OPII, sive THEBAICA; vulgo LAUDANUM LIQUIDUM. *Ed.*

Tincture of Opium, or *Thebaic Tincture*, commonly called *Liquid Laudanum.*

Take of Opium, two ounces;
Weaker alcohol, two pounds.
Digest for seven days, and filter through paper.

Dub.

Take of Turkey opium, in coarse powder, ten drachms;
Proof-spirit of wine, one pint.
Macerate for fourteen days, and strain.

Lond.

Take of Hard opium, powdered, two ounces and a half;
Proof-spirit, two pints.
Macerate for fourteen days, and strain.

As these tinctures, on evaporation, furnish the same quantity of extract, they are believed to be of nearly equal strength; but it is to be regretted that they do not keep so well as could be wished: after some time a part of the opium is gradually deposited from both, and consequently the tinctures become weaker: the part which thus separates amounts sometimes, it is said, to near one-fourth of the quantity of opium at first dissolved. Mr Phillips found, that when alcohol of sp. gr. 0.930 was employed with select crude opium, the tincture acquired sp. gr. 0.952, and contained 26 grains of opium *per* fluidounce; but when purified opium was used, the sp. gr. of the tincture was 0.958, and the quantity of opium in the fluidounce 36 grains; of the crude opium one grain in 3.5 remained undissolved, and of the purified only one in twenty-five; while in the tincture made with the former, one grain of opium was contained in 18.3 minims, and in that with the latter in 13.3, so that from calculation the strength of the tincture made with purified opium is to that made with crude opium as three to two nearly. But I must here observe, that calculation cannot be altogether relied upon in this case, because although purified opium contains more soluble matter than crude opium, its narcotic powers may be diminished by the preparation it has undergone.

In Britain the term *Laudanum* is now almost exclusively restricted to the simple tincture of opium; but formerly it was, and still is, on the Continent, extended to solutions of opium of different kinds, and also to the extracts obtained by their evaporation; the former being distinguished by the addition of the epithet *liquidum.* Thus three kinds of laudanum are known in France; 1*st*, The *Laudanum opiatum:* this is the dry extract *(opostolé sec.* Chereau) of opium. 2*d*, The laudanum of Rousseau, *Opium de Rousseau;* (opiate wine prepared by fermentation, Codex), (*œnolé d'opium*, Ch.) 3*d*, The liquid laudanum of Sydenham, (Compound opium wine, Codex), (*œnolé d'opium et safran*, Ch.)

Off. Prep.—Enema opii, *D.* Linim. saponis cum opio, *D.*

TINCTURA OPII CAMPHORATA, vulgo ELIXIR PAREGORICUM ANGLORUM. *Ed.*

Camphorated Tincture of Opium, English Paregoric Elixir.

Take of Camphor, two scruples;

Benzoic acid,
Opium, of each a drachm;
Weaker alcohol, two pounds and a half.
Digest for seven days, and filter through paper.

Dub.

Take of Camphor, two scruples;
Turkey opium, in powder,
Benzoic acid, of each one drachm;
Essential oil of aniseed, one drachm;
Proof-spirit of wine, two pints.
Digest for fourteen days, and strain.

TINCTURA CAMPHORÆ COMPOSITA. *Lond.*

Compound Tincture of Camphor.

Take of Camphor, two scruples;
Hard opium, in powder,
Benzoic acid, of each one drachm;
Proof-spirit, two pints.
Macerate for fourteen days, and filter.

IN this formula, the virtues of the opium and camphor are combined. The benzoic acid and oil of aniseed were supposed to be balsamic. This oil gives a peculiarity of flavour to that of the Dublin College, which was offensive to many. It is omitted from the others.

Med. use.—This composition was originally prescribed under the title of *Elixir Asthmaticum*, which it does not ill deserve. It contributes to allay the tickling which provokes frequent coughing; and at the same time it is supposed to give greater liberty of breathing. It is given to children against the chincough, &c. in doses of from five drops to twenty; to adults, from twenty to an hundred. Half an ounce, by measure, contains about a grain of opium.

TINCTURA QUASSIÆ EXCELSÆ. *Ed.* TINCTURA QUASSIÆ. *Dub.*

Tincture of Quassia.

Take of Shavings of quassia, one ounce;
Proof-spirit, two pints, (two pounds and a half, *Ed.*)
(Macerate, *D.*), digest for seven days, and filter.

THIS tincture is one of the purest and most intense of bitters.

TINCTURA RHEI. *Ed.*

Tincture of Rhubarb.

Take of Russian rhubarb, sliced, three ounces;
Lesser cardamom seeds, bruised, half an ounce;

Weaker alcohol, two pounds and a half.
Digest for seven days, and strain through paper.

Lond.

Take of Rhubarb, sliced, two ounces;
Lesser cardamom seeds, bruised, half an ounce;
Saffron, two drachms;
Proof-spirit, two pints.
Macerate for fourteen days, and filter.

THESE are simple tinctures, with the addition only of cardamom as a corrigent. The London has also its colour heightened by saffron. It is used chiefly as a stomachic.

TINCTURA RHEI COMPOSITA. *Dub.*

Compound Tincture of Rhubarb.

Take of Rhubarb, sliced, two ounces;
Lesser cardamom seeds, husked and bruised,
Liquorice root, bruised, of each half an ounce;
Saffron, two drachms;
Proof-spirit of wine, two pints.
Macerate for seven days, and strain.

Lond.

Take of Rhubarb, sliced, two ounces;
Liquorice root, bruised, half an ounce;
Ginger, sliced,
Saffron, each two drachms;
Proof-spirit, one pint;
Water, twelve fluidounces.
Macerate for fourteen days, and strain.

THIS differs from the simple tincture, chiefly in being sweetened by the liquorice root, and in the weaker spirit used by the College of London. A larger dose of this may therefore be given without the fear of giving too much spirit.

TINCTURA RHEI ET ALOES. *Ed.*

Tincture of Rhubarb and Aloes.

Take of Russian rhubarb, sliced, ten drachms;
Socotorine aloes, in powder, six drachms;
Lesser cardamom seeds, bruised, half an ounce;
Weaker alcohol, two pounds and a half.
Digest for seven days, and strain through paper.

TINCTURA RHEI ET GENTIANÆ. *Ed.*

Tincture of Rhubarb with Gentian.

Take of Russian rhubarb, sliced, two ounces;

Gentian root, sliced, half an ounce;
Weaker alcohol, two pounds and a half.
Digest for seven days, and strain through paper.

ALL the foregoing tinctures of rhubarb are designed as stomachics and corroborants, as well as purgatives; spiritous liquors extract freely those principles of the rhubarb in which the two first qualities reside, and the aromatics and gentians considerably promote their efficacy. In weakness of the stomach, indigestion, laxity of the intestines, diarrhœas, colic, and other similar complaints, these medicines are frequently of great service. This tincture, from the addition of aloes, is more efficacious as a purgative.

TINCTURA SAPONIS CAMPHORATA, vulgo LINIMENTUM SAPONACEUM. *Ed.*

Camphorated Tincture of Soap; Saponaceous Liniment.

Take of Hard soap, in shavings, four ounces;
Camphor, two ounces;
Volatile oil of rosemary, half an ounce;
Stronger alcohol, two pounds.
Digest the soap in the alcohol for three days; then add to the filtered liquor the camphor and the oil, shaking them well together.

LINIMENTUM SAPONIS COMPOSITUM. *Lond.*

Compound Soap Liniment.

Take of Hard soap, three ounces;
Camphor, one ounce;
Spirit of rosemary, one pint.
Dissolve the camphor in the spirit; then add the soap, and macerate in a sand-bath until it be dissolved.

LINIMENTUM SAPONIS. *Dub.*

Soap Liniment.

Take of Soap, three ounces;
Camphor, one ounce;
Spirit of rosemary, one pint.
Digest the soap in the spirit of rosemary until it be dissolved, then add the camphor.

LINIMENT. SAPONIS CUM OPIO, vel LINIM. ANOD. *Dub.*

Liniment of Soap and Opium, or *Anodyne Liniment.*

Take of Liniment of soap, four parts by measure;
Tincture of opium, three parts. Mix.

TINCTURA SAPONIS ET OPII; vulgo LINIM. ANODYNUM. *Ed.*

Tincture of Soap with Opium, or *Anodyne Liniment.*

Take of Hard soap, shaved, four ounces;
Opium, one ounce;
Camphor, two ounces;
Volatile oil of rosemary, half an ounce;
Stronger alcohol, two pounds.

Digest the soap and opium in the alcohol for three days; then add to the filtered liquor the camphor and oil, and shake them well.

THESE tinctures are only used externally, and possess great efficacy in removing local pains, when rubbed on the affected part. The London College has omitted the anodyne liniment, probably as it may be easily prepared extemporaneously, by mixing an equivalent proportion of laudanum with soap liniment, as now prescribed by that of Dublin.

TINCTURA SCILLÆ MARITIMÆ. *Ed.*

Tincture of Squills.

Take of Fresh dried squills, two ounces;
Weaker alcohol, sixteen ounces.

Digest for seven days, and filter through paper.

TINCTURA SCILLÆ. *Dub.*

Tincture of Squills.

Take of The bulb of the sea squill, fresh dried, four ounces;
Proof-spirit of wine, two pints.

Macerate for seven days; then set it aside, and when the fæces have subsided, pour off the pure liquor.

Lond.

Take of Squills, fresh dried, four ounces;
Proof-spirit, two pints.

Macerate for fourteen days, and strain.

THE active principle of squills is soluble in alcohol, and the tincture is a useful remedy in doses of ten drops or more three times a-day. Fifteen drops are apt to produce nausea.

TINCTURA SENNÆ COMPOSITA. *Ed.*

Compound Tincture of Senna.

Take of Senna leaves, two ounces;
Jalap root, bruised, one ounce;
Coriander seeds, bruised, half an ounce;
Weaker alcohol, three pounds and a half.

Digest for seven days, and to the tincture, filtered through paper, add
Double refined sugar, four ounces.

Dub.

Take of Senna leaves, one pound;
Caraway seeds, bruised, one ounce and a half;
Lesser cardamom seeds, husked and bruised, half an ounce;
Proof-spirit, one gallon.
Macerate for fourteen days, and strain.

Lond.

Take of Senna leaves, three ounces;
Caraway seeds, bruised, three drachms;
Cardamom seeds, bruised, one drachm;
Raisins, stoned, four ounces;
Proof-spirit, two pints.
Macerate for fourteen days, with a gentle heat, and filter.

These tinctures are useful carminatives and cathartics, especially to those who have accustomed themselves to the use of spiritous liquors; they often relieve flatulent complaints and colics, where the common cordials have little effect; the dose is from one to two ounces.

TINCTURA SERPENTARIÆ. *Lond. Dub.*

Tincture of Snake-root.

Take of Virginian snake-root, sliced and bruised, three ounces;
Proof-spirit, two pints.
Macerate for seven days, (fourteen, *Lond.*), and strain.

TINCTURA ARISTOLOCHIÆ SERPENTARIÆ. *Ed.*

Tincture of Snake-root.

Take of Virginian snake-root, bruised, two ounces;
Cochineal, in powder, one drachm;
Weaker alcohol, two pounds and a half.
Digest for seven days, and strain through paper.

This tincture, which contains the whole virtues of the root, may be taken to the quantity of a spoonful or more every five or six hours; and to this extent it often operates as an useful diaphoretic. The Edinburgh tincture is coloured by cochineal, the other not.

TINCTURA VALERIANÆ. *Lond. Dub.*

Tincture of Valerian.

Take of The root of wild valerian, in coarse powder, four ounces;
Proof-spirit, two pints.
Macerate for seven days, (fourteen, *Lond.*) and strain.

This tincture has a deep colour, and is strongly impregnated with the valerian; though it has not been found to answer so well in the cure of hysteric disorders as the root in substance, exhibited in the form of powder or bolus. The dose of the tincture is from half a spoonful to a spoonful or more, two or three times a-day.

TINCTURA VERATRI ALBI. *Ed.*

Tincture of White Hellebore.

Take of White hellebore root, bruised, four ounces;
Diluted alcohol, sixteen ounces.
Digest for seven days, and filter the tincture through paper.

This tincture cannot fail to be a powerful and even a dangerous remedy, since it contains the very active alkaloid *Veratria.* It is sometimes used for assisting cathartics, &c. and as an emetic in apoplectic and maniacal disorders. It may likewise be so managed, as to prove a powerful alterative and deobstruent in cases where milder remedies have little effect. But a great deal of caution is requisite in its use; the dose at first ought to be only a few drops; if considerable, it proves violently emetic or cathartic.

TINCTURA ZINGIBERIS. *Lond.*

Tincture of Ginger.

Take of Ginger, sliced, two ounces;
Rectified spirit, two pints.
Macerate for fourteen days, and strain.

Dub.

Take of Ginger root, in coarse powder, two ounces;
Proof-spirit, two pints.
Macerate for seven days; then filter.

TINCTURA AMOMI ZINGIBERIS. *Ed.*

Tincture of Ginger.

Take of Ginger, bruised, two ounces;
Weaker alcohol, two pounds and a half.
Digest for seven days, and filter through paper.

The tincture prepared with proof spirit is always muddy, but a clear tincture is got by using two pounds of rectified spirit, and half a pound of spirit 7° above proof. The London College now order rectified spirit.

CHAP. XXXII.

TINCTURES MADE WITH ETHERIAL SPIRITS.

WE have classed these tinctures by themselves, because they are more strongly characterised by the nature of the menstruum than of the substances dissolved in it. Indeed, the etherial spirits are used in these instances, not to dissolve substances which would resist the action of alcohol and water, but for the sake of their own direct action on the system. The French pharmaceutists also make a separate order of preparations of this kind, under the name of *Etherolés.*

TINCTURA ALOES ÆTHEREA. *Ed.*
Etherial Tincture of Aloes.

Take of Socotorine aloes,
Myrrh, of each, in powder, one ounce and a half;
Saffron, sliced, one ounce;
Sulphuric ether with alcohol, one pound.

Digest the myrrh with the ether for four days; then add the saffron and aloes.

Digest again for four days, and when the fæces have subsided, pour off the tincture.

THIS tincture agrees generally in its effects with the other tinctures of aloes, the only difference arising from the more penetrating and stimulating nature of the menstruum itself.

ÆTHER SULPHURICUS CUM ALCOHOLE AROMATICUS. *Ed.*
Aromatic Sulphuric Ether with Alcohol.

Take of Cinnamon bark, bruised,
Lesser cardamon seeds, bruised, of each an ounce;
Long pepper, in powder, two drachms;
Sulphuric ether with alcohol, two pounds and a half.

Digest for seven days, and filter through paper.

To the taste this composition is gratefully aromatic, without any perceptible acidity, and may be given as a substitute for spirit of sulphuric ether.

ACIDUM SULPHURICUM AROMATICUM. *Ed. Dub.*
Aromatic Sulphuric Acid.

Take of Alcohol, two pounds, (rectified spirit, two pints, *D.*);

Sulphuric acid, six ounces.

Drop the acid gradually into the alcohol. Digest the mixture with a very gentle heat, in a close vessel, for three days, and then add, of

Cinnamon bark, bruised, one ounce and a half;
Ginger root, bruised, one ounce.

Digest again, in a close vessel, for six days, and then filter the tincture through paper placed in a glass funnel.

I PLACED this preparation here, from the belief that the alcohol was completely or partially changed, by the digestion with the acid into an etherial spirit; and that the principal difference between this and the preceding tincture consisted in the presence of the acid. This is also the opinion of the French pharmaceutists, who say, that it cannot with propriety derive its name from the acid, which, by reacting on the alcohol and vegetable substances, is modified. But I am now of opinion that this is an error; for I have ascertained, that alcohol and sulphuric acid, mixed in the proportions here stated, do not react on each other. Its present name is therefore correct, and it is to be considered as sulphuric acid diluted with spirit instead of water. It is a simplification of the acid elixir of Mynsicht, which contained a farrago of other aromatics.

Med. use.—It is a valuable medicine in weakness and relaxation of the stomach, and decay of constitution, particularly in those cases which proceed from irregularities, which are accompanied with slow febrile symptoms, or which follow the suppression of intermittents.

It is very usefully conjoined with cinchona, and other tonic barks, not only as covering their disagreeable taste, but also as coinciding with them in virtue, and very probably by rendering the alkaloids, as cinchona and quinia, more soluble in water. It may be given in doses of from ten to thirty drops, or more, several times a-day.

CHAP. XXXIII.

AMMONIATED OR VOLATILE TINCTURES.

AMMONIA, like ether, is so powerful an agent on the living system, that it gives a peculiar character to the compositions into which it enters. They are all highly stimulating and pungent, and apt to excite diaphoresis. As ammonia exerts considerable and peculiar powers as a solvent, these tinctures must never be combined in prescription with any thing acid, which would not only neutralize the ammonia, and destroy its peculiar action on the living system, but would precipitate whatever was dissolved by its agency.

LINIMENTUM CAMPHORÆ COMPOSITUM. *Lond. Dub.*

Compound Camphor Liniment.

Take of Camphor, two ounces;
Water of ammonia, six fluidounces;
Spirit of lavender, a pint.

Mix the water of ammonia with the spirit; and distil from a glass retort, with a slow fire, one pint. Then dissolve the camphor in the distilled liquor.

THIS is not a very judicious process. By the distillation, the water with which the ammonia was combined is left as a residuum, and a strong ammoniated alcohol is procured; but the same end could be obtained by mixing the strong water of ammonia of the Edinburgh College with the spirit of lavender, without the trouble of distillation.

Med. use.—It is intended for external use only as a rubefacient, and is more stimulant than simple tincture of camphor. There is no danger of its being too caustic, from the ammonia being too predominant.

TINCTURA CASTOREI COMPOSITA. *Ed.*

Compound Tincture of Castor.

Take of Castor, in powder, one ounce;
Assafœtida, half an ounce;
Ammoniated alcohol, one pound.

Digest for seven days, and filter through paper.

THE ammoniated alcohol is an excellent menstruum for the castor and the assafœtida, and greatly adds to their virtues. This composition is a medicine of considerable efficacy, particularly in hysterical disorders, and the several symptoms which accompany them.

TINCTURA CINCHONÆ AMMONIATA. *Lond.*

Ammoniated Tincture of Cinchona.

Take of Lance-leaved cinchona bark, in powder, four ounces;
Aromatic spirit of ammonia, two pints.

Macerate for ten days, and strain.

THIS does not appear to be a very judicious preparation, or at least it can only act as a modification of ammoniated alcohol, for the cinchona cannot be supposed to contribute at all to its effects.

SPIRITUS COLCHICI AMMONIATUS. *Lond.*
Ammoniated Spirit of Colchicum.

Take of Colchicum seeds, bruised, two ounces;
Aromatic spirit of ammonia, one pint.
Macerate for fourteen days, and filter.

THE seeds of this plant contain its narcotic principle; and as they are less liable to variation and much less to decay than the root, they are perhaps preferable as the material for all its preparations. The selection of this menstruum is probably intended to combine, with the narcotic, a diffusible stimulus as a corrector. But as veratria is an alcaloid, it may be doubted whether the ammonia facilitates its solution. The simple tincture of the Dublin College seems to me preferable.

TINCTURA GUAIACI AMMONIATA. *Ed.*
Ammoniated Tincture of Guaiac.

Take of Resin of guaiac, in powder, four ounces;
Ammoniated alcohol, one pound and a half.
Digest for seven days, and filter through paper.

Lond. Dub.

Take of Guaiac gum resin, in powder, four ounces;
Aromatic spirit of ammonia, one pint and a half.
Macerate for fourteen (seven *Dub.*) days, and filter.

THESE are very efficacious tinctures; the ammoniated spirit readily dissolving the resin, and at the same time promoting its medicinal virtue. In rheumatic cases, a teaspoonful, or even table-spoonful, is given every morning and evening, in any convenient vehicle, particularly in milk, as a sudorific.

TINCTURA OPII AMMONIATA, olim ELIXIR PAREGORICUM. *Ed.*
Ammoniated Tincture of Opium, formerly *Paregoric Elixir.*

Take of Opium, two drachms;
Saffron, sliced,
Benzoic acid, of each three drachms;
Volatile oil of aniseed, half a drachm;
Ammoniated alcohol, sixteen ounces.
Digest for seven days, and filter through paper.

This preparation is in common use in this part of the empire, and is now called *Scotch* Paregoric Elixir, to distinguish it from the *English* Paregoric Elixir, which contains only one-fourth of the quantity of opium, and is otherwise different. The propriety of its composition may be doubted. From the property which alkalies possess of throwing down the morphia from watery solutions in the state of an insoluble precipitate, it is evident that the addition of any alkali diminishes the solvent power of the menstruum, and is therefore injudicious. It is true that the morphia itself is soluble in strong alcohol, and therefore, from a tincture made with it no precipitate occurs on the addition of an alkali; but the precipitation takes place when the strong tincture is diluted.

Med. use.—It is however a preparation of considerable efficacy in many spasmodic diseases, as chincough, &c., the ammonia removing the spasm immediately, while the opium tends to prevent its return. Each drachm contains about a grain of opium.

TINCTURA VALERIANÆ AMMONIATA. *Lond.*

Ammoniated Tincture of Valerian.

Take of Valerian root, four ounces;
Aromatic spirit of ammonia, two pints.
Macerate for fourteen days, and strain.

Dub. Ed.

Take of Valerian root, in powder, two ounces, (four ounces, *Ed.*);
Spirit of ammonia, one pint, (two pounds and a half, *Ed.*)
Digest (macerate, *Dub.*) for seven days, and filter.

The spirit of ammonia, both simple and compound, is here an excellent menstruum, and at the same time considerably promotes the virtues of the valerian, which, in some cases, wants assistance of this kind. The dose may be a tea-spoonful or two.

SPIRITUS AMMONIÆ SUCCINATUS. *Lond.*

Succinated Spirit of Ammonia.

Take of Mastiche, three drachms;
Rectified spirit, nine fluidrachms;
Oil of lavender, fourteen minims;
Oil of amber, four minims;
Solution of ammonia, ten fluidounces.
Macerate the mastiche in the alcohol until it be dissolved.

Pour off the clear tincture; then add the other ingredients, and mix them by shaking.

THIS preparation is intended as a substitute for *Eau de Luce;* but it has not that permanent milky opacity, which is deemed essential to good *Eau de Luce.* According to the annotators, the milky opacity of *Eau de Luce* depends on the oil of amber, which ought to be well rectified, and on the strength of the ammonia, which ought not to exceed sp. gr. 0.935. Notwithstanding these precautions, it still happens that it loses its opacity. The French Pharmacopœia proposes the addition of a little soap of almond oil, probably to augment the proportion of soap, *(savonule.)* In other receipts the alkali is increased by the addition of a little subcarbonate of potass.

Med. use.—Eau de Luce is not employed internally, as it might be dangerous on account of its pungency. It is a powerful stimulant in faintings and torpor; and may be used in the same circumstances, and in the same doses, as the spirit of ammonia itself.

CHAP. XXXIV.—MEDICATED WINES.

IT is now proposed to distinguish preparations, in which wine is the excipient, by the term *Œnolés.* The French Codex directs, that for the preparation of medicinal wines, genuine and pure wines of the more generous kinds should be chosen, that they should be prepared in small quantities at a time, as being disposed to spoil, and should be kept in well-corked bottles, and in a cool cellar. In preparing medicated wines no heat should be applied; simple maceration is sufficient. The Edinburgh College direct, "Wines are to be prepared in corked phials, and frequently shaked during their preparation."

Parmentier has endeavoured to prove that wine is an extremely bad menstruum for extracting the virtues of medical substances. His argument is, that, by the infusion of vegetable substances in wine, its natural tendency to decomposition is so much accelerated, that at the end of the process, instead of wine, we have only a liquor containing the elements of bad vinegar. As a solvent, diluted alcohol in his opinion perfectly superseded the use of wine; and if we wish to use wine to cover the taste, or to assist the operation of any medicine, M. Parmentier proposes that a tincture of the substance should be extemporaneously mixed with wine as a vehicle. This exclusive view of the subject is not adopted by the translators of this volume. They admit, indeed, that when wine has answered the purpose of an excipient, it differs from what it was before. But that is the case with all bodies considered as excipients. From their original state of water, wine, &c. they pass into quite another state, in consequence of this conversion. They acquire new principles by reason of the bodies they dissolve, and by the effects of diverse processes which are applied to them. Lastly, they change their physical properties for new properties, which constitute them medicines, and which, for the most part, prevent them from being restored to their primary condition. They also state, that Parmentièr originally suggested this process only for the preparation of medicinal wines in quantity, for military hospitals: and in this respect his method possessed numerous advantages; for in these establishments, often moveable, there is a want of time and of good wines. But this is not the case in civil practice. Here every facility exists, and there is nothing to prevent medicinal wines from possessing all their requisite properties.

The London College, in their last edition (1825,) have rejected altogether the use of wine in pharmacy, and even erased it from the Materia Medica. They have however retained the titles of the old wines, substituting a mixture of spirits and water. The proportion of these, taken as equivalent to wine, is not however uniform. In the *Vinum aloes* and *V. colchici*, it is one part of proof-spirit to two of water; in the *V. ipecacuanhæ* and *V. opii*, three to five, and in the *V. veratri*, two to three.

VINUM ALOES SOCOTORINÆ. *Ed.*

Wine of Socotorine Aloes.

Take of Socotorine aloes, in powder, one ounce;
Lesser cardamom seeds, bruised,
Ginger, bruised, each one drachm;
Sherry, two pounds.

Digest for seven days, and strain.

VINUM ALOES. *Dub.*

Wine of Aloes.

Take of Socotorine aloes, four ounces;
Canella alba, one ounce;
Spanish white wine, three pints;
Proof-spirit, one pint.

Powder the aloes and canella alba separately; then mix and pour on the wine, mixed with the spirit; afterwards digest for fourteen days, frequently shaking the vessel; and, lastly, filter the liquor.

Lond.

Take of Socotorine aloes, eight ounces;
Canella alba, two ounces;
Proof-spirit,
Distilled water, of each, four pints.

Triturate the aloes with well-washed white sand to powder; also powder the canella, and pour the spirit and water upon these powders mixed together. Macerate for fourteen days, now and then shaking them, and strain.

THE sand is added to prevent the aloes, when moistened by the fluids, from running together into masses. It is evident that it does not affect the tincture.

Med. use.—Aloetic wine has long been in great esteem, not only as a cathartic, but likewise as a stimulus. It appears from long experience to be a very useful medicine. The dose, as a purgative, is from one to two ounces. It may be administered so as to have excellent effects, as an alterant, by giving it in small doses, at proper intervals. Thus managed, it does not for a considerable time operate remarkably by stool; but at length proves purgative, and occasions a lax habit, of much longer continuance than that produced by the other common cathartics.

VINUM COLCHICI. *Lond.*

Wine of Meadow Saffron.

Take of Fresh meadow saffron root, sliced, one pound;
Weaker spirit, four fluidounces;
Distilled water, eight fluidounces.

Macerate for fourteen days, and filter.

THIS is the preparation which Sir E. Home used in his own case, and recommended strongly to others for relieving the painful paroxysms of gout. It is, however, objectionable on account of the mucilaginousness and inequality of the recent root. It may be given in doses of one or two drachms.

VINUM GENTIANÆ COMPOSITUM. *Ed.*

Compound Wine of Gentian.

Take of Gentian root, half an ounce;
Cinchona bark, one ounce;
Seville orange-peel, dried, two drachms;
Canella alba, one drachm;

Weaker alcohol, four ounces;
Sherry wine, two pounds and a half.

First pour the alcohol on the root and barks, sliced and bruised, and, after twenty-four hours, add the wine; then macerate for seven days, and strain.

GENTIAN wine, which is a pleasant bitter, is intended as a substitute for the old *Tinctura ad Stomachicos.* Wines of this kind are sometimes introduced at the tables of epicures in Italy, to assist the stomach in digestion.

VINUM IPECACUANHÆ. *Dub.*

Wine of Ipecacuanha.

Take of The root of ipecacuan, bruised, two ounces;
Spanish white wine, two pints.

Macerate for fourteen days, and strain.

Ed.

Take of Ipecacuan root, bruised, one part;
Sherry wine, fifteen parts.

Macerate for seven days, and filter through paper.

Lond.

Take of Ipecacuan root, bruised, two ounces;
Proof-spirit, twelve fluidounces;
Distilled water, twenty fluidounces.

Macerate for fourteen days, and filter.

IPECACUAN wine is a very mild and safe emetic, and equally serviceable, in dysenteries, with the root in substance. The common dose is an ounce, more or less, according to the age and strength of the patient. In smaller doses it acts as an expectorant.

VINUM NICOTIANÆ TABACI. *Ed.*

Tobacco Wine.

Take of The dried leaves of tobacco, one part;
Sherry wine, twelve parts.

Macerate for seven days, and strain the liquor through paper.

WINE seems to extract more fully the active principles of the tobacco than either water or spirit taken separately.

VINUM OPII. *Ed. Dub.*

Wine of Opium.

Take of Extract of opium, (Turkey opium, *Dub.*) one ounce;
Cinnamon, bruised,

Cloves, bruised, of each one drachm;
Sherry wine, sixteen ounces, (one pint, *Dub.*);
Macerate for eight days, and filter.

Lond.

Take of Extract of opium, one ounce;
Cinnamon bark, bruised,
Cloves, bruised, of each a drachm;
Weaker spirit, six fluidounces;
Distilled water, ten fluidounces.
Macerate for eight days, and filter.

THIS is the *Tinctura Thebaica* of the Dispensatory 1745; the *Laudanum liquidum* of Hoffman, which has continued to be popular, notwithstanding its exclusion from some late Pharmacopœias. Mr Ware, in particular, considers it as superior to every other solution of opium as an application in chronic inflammation of the eyes; and, with the same intention, it is sometimes used when inspissated by spontaneous evaporation.

VINUM RHEI. *Ed.*
Rhubarb Wine.

Take of Russian rhubarb, sliced, two ounces;
Canella alba, bruised, one drachm;
Weaker alcohol, two ounces;
Sherry wine, fifteen ounces.
Macerate for seven days, and strain through paper.

RHUBARB wine is a warm, cordial, laxative medicine. It is used chiefly in weakness of the stomach and bowels, and some kinds of looseness, for evacuating the offending matter, and strengthening the tone of the viscera. It may be given in doses of from half a spoonful to three or four spoonfuls or more, according to the circumstances of the disorder, and the strength of the patient.

VINUM VERATRI. *Lond.*
Wine of White Hellebore.

Take of White hellebore root, sliced, eight ounces;
Proof spirit, a pint;
Distilled water, a pint and a half.
Macerate for fourteen days, and filter.

THIS preparation is now introduced, we are told by Dr Powell, "because it is a medicine usefully and extensively "employed in practice." This must be understood as applying only to London; for it is not yet known in Edinburgh, although there can be no doubt of its activity. From its containing veratria, its action will probably coincide with that of Colchicum wine.

CHAP. XXXV.—EXTRACTS AND RESINS.

EXTRACT, in pharmacy, has long been used, in the common and true acceptation of the term, to express a thing extracted, and therefore it was applied to substances of all kinds extracted from heterogeneous bodies, by the action of any menstruum, and again reduced to a consistent form, by the evaporation of that menstruum. Lately, however, Extract has been used in a different and much more limited sense, as the name for a peculiar principle, the saponaceous of Rouelle, the existence of which is now rendered very doubtful. It is in the former sense only that we have employed the term *Extract;* and for the new substance we proposed the term *Extractive*, which has been generally adopted.

The London College have also added to the confusion by extending the term Extract to what are commonly called Inspissated juices, where no menstruum is employed.

Extracts are of various kinds, according to the nature of the substances from which they are obtained, and the menstruum employed; but they commonly consist of mucilaginous, resinous, saccharine, extractive, astringent, acid, and alkaline principles, more or fewer of them, mixed in various proportions.

Various classifications have been proposed and made, especially by Rouelle, Braconnot and Recluz; but they are all liable to objections, and too refined for practice.

In a general way, they may be considered as differing in their origin, and, in this point of view, they may be divided into vegetable and animal extracts. Of the latter order there is no example retained in any of the British Pharmacopœias, but inspissated bile and portable soup may be mentioned as instances.

From the nature of the menstruum, they may be classed into aqueous and alcoholic extracts. Other solvents are rarely used. Ether is too expensive and limited in its operation. Acetic acid alters the nature of the product, and wine leaves its own extract in the product.

From the degree of consistence to which these are reduced, they are liquid, soft, solid or dry.

From their predominant ingredient, they may be divided into gummy, resinous, gummo-resinous, saccharine, acido-saccharine, bitter, &c.

Henry and Guibourt, in their *Pharmacopée Raisonnée*, divided them merely into vegetable and animal, and the former into inspissated juices, aqueous and alcoholic extracts, which answers well for practical purposes.

The preparation of extracts is a pharmaceutic problem of great importance and of considerable difficulty, and in regard to which there is still much to be learned. Its importance is demonstrated by the experiments of Orfila, who found that the extracts of the narcotic plants were highly deleterious when well prepared, and often quite inert as found in the shops.

To give some method to our remarks, we may consider, 1. The preparation of the substance from which an extract is to be made; 2. The choice of a menstruum; 3. The mode of extraction; 4. The mode of inspissation; 5. The manner of preservation; and, 6. The tests of its goodness.

It is almost indifferent, with regard to the medicine, whether the subject be used fresh or dry, since nothing that can be preserved in this process will be lost by drying; on the contrary, some inert principles, which are given out by the fresh herb, become nearly insoluble by drying. With regard to the facility of extraction, however, there is a very considerable difference, vegetables in general giving out their active principles more readily when dried than when fresh. In many cases, it is necessary to assist the action of the menstruum by mechanical division, but it should not be carried so far as to reduce the substance to a very fine powder; as Fabbroni found that cinchona, at least, yielded a larger proportion of extract when only coarsely powdered.

The menstrua most commonly employed are water and alcohol. Water is the menstruum most economically employed in making extracts, as it is capable of dissolving all the active principles except resin, and can have its solvent powers assisted by a considerable degree of heat. The chief objection to its use is, that it renders the principles extracted prone to decomposition, and requires immediate evaporation.

That the evaporation may be performed more quickly, and at less expense, the quantity of water employed ought to be no greater than is necessary for extracting the virtues of the subject. This point, however, is not very easily ascertained; for although some of the common principles of extracts be soluble in a very small proportion of water, there are others, of which water can dissolve only a certain proportion: besides, we have no easy method of knowing when we have used a sufficient quantity of water; for vegetable substances will continue to colour deeply successive portions of water, long after they are yielding little to it but colouring matter. One of the best methods is to act upon the subject with successive quantities of water, as long as the decoctions form a considerable precipitate with the test which is proper for detecting the substance we are desirous of extracting, such as a solution of gelatine for astringency, of subcarbonate of potass for the alcaloids, of alum for extractive, &c.

The temperature at which the extraction is made is not indifferent. The solvent power of water, in regard to some principles, is much increased by increase of temperature, and accordingly boiling water will extract them in greater quantity, and more quickly, than cold. But, on the other hand, a certain increase of temperature is sufficient to effect some chemical changes, by coagulating and rendering insoluble certain principles soluble in cold water, and by giving rise to the formation of some insoluble compounds by the union of principles in themselves soluble. I have discovered one vegetable principle, at least, Mudarine, which is more soluble in cold than in warm water; and it is rather probable that there are others. M. Cadet de Vaux concluded, from experiments made by M. Charpentier, under his direction, that a larger quantity of extract was furnished by maceration and infusion than by decoction. M. Guibourt prosecuted the subject, and found that it was true in regard to some subjects, and not to others. It was true with regard to gentian and other substances not woody in their texture, and whose principles were readily soluble in water; but rhubarb gave the same weight of extract by infusion and by decoction, while cinchona bark and rhatany root gave more by decoction than by infusion; but the quality of the extract from decoction was very inferior, containing a large proportion of tannate of starch insoluble in cold, whereas the extract from infusion was almost entirely soluble in cold water. In general, Guibourt found that substances which contain starch yield more extract by decoction than by infusion. The increased solvent power which water acquires from heat is a disadvantage whenever cold water is capable of dissolving the active ingredient, because it is thus more contaminated with mucilaginous and inert principles, which increase its quantity and impair its quality. Accordingly, although extracts are in general prepared from decoction, it would be sometimes more advantageous to employ infusion in boiling, or even in cold water, as in La Garay's method.

The action of the menstruum is always assisted by various modes of agitation; and very strong pressure, by means of a hydrostatic press, has been introduced by Real and Römershausen, but without any very evident advantage.

If the extraction has been assisted by the boiling temperature, the decoction often becomes turbid on cooling, and lets fall a deposite when allowed to remain at rest. It is necessary to know of what principles this deposite is formed before we can determine whether it should be separated or not before we proceed to inspissation. It is very abundant from the astringent barks, and in them consists of tannate of starch, which is probably inert, and may be rejected with advantage to the preparation. Some pharmaceutists are not contented with separating the first deposite; but after the evaporation has proceeded a considerable length, they allow the thin extract to cool, and once more form deposite, which is also thrown away. This step is in all cases very doubtful; for, in some cases, the most active principle will in this way be rejected.

If the extraction has been performed by cold water, the infusions may either be boiled or evaporated entirely at a considerably lower temperature. The ebullition is to be avoided if there be any volatile principle present, which it is desirable to retain, or if there be great tendency to decomposition; but sometimes it is proper to bring the infusion to boil completely, when by that means we cause the coagulation of vegetable albumen and other inert principles, even if we should complete the inspissation at a much lower temperature. There are various methods of dissipating the menstruum, and inspissating the extract; 1*st*, *In vacuo*, by Mr Barry's method; 2*d*, By distributing the solution on a number of flat vessels in the stove; 3*d*, By the heat of a water or steam bath; 4*th*, By a sand bath, or over the open fire.

Whatever be the mode of applying the heat, there can be little doubt that the inspissation ought to be completed as quickly as possible; and evaporation is accelerated, 1*st*, By exposing a large surface, and hence it is generally performed in broad shallow vessels; 2*dly*, By removing the vapour from the surface as fast as it is formed, either by a current of air blowing over it, or by inclosing it in a vessel along with sulphuric acid, or some other substance having a strong attraction for water; and in this way very perfect extracts on a small scale are now often prepared; 3*dly*, By causing ebullition in the evaporating fluid. In the open air this can only be effected at a temperature so high as to be dangerous to the success of the process; but by taking off the pressure of the atmosphere, as in Mr Barry's method, we can evaporate at a very greatly reduced temperature; and by combining the removal of atmospheric pressure with the rapid absorption of the vapour, as in Professor Leslie's mode of freezing, we possess a method, although expensive, of making very perfect extracts.

If we evaporate by heat in the open air, when the matter begins to grow thick, great care is necessary to prevent its burning. This accident is almost unavoidable if the quantity be large, and the fire directly applied, as usual, under the evaporating basin. It may, however, be prevented, by finishing the evaporation by a water or steam bath, or by pouring the extract, when it has acquired the consistence of a syrup, into shallow tin or earthen pans, and placing these before the fire, or in an oven with its door open, moderately heated; which, acting uniformly on every part of the liquid, will soon reduce it to any degree of consistence required. Even where a vapour or steam bath is used, the heat should be applied only to the bottom of the vessel, otherwise a thin crust is apt to form on the sides, which does not easily incorporate with the rest of the extract.

When the extracts are reduced to the desired degree of consistency, they should be put into pots of well-glazed earthenware of good quality; their surface should be covered either with a layer of melted white wax, or with a piece of paper wetted with strong spirits, which adheres closely to it, and prevents the direct contact of the air; the mouth of the vessel closed with a cork, over which wax or rosin should be spread, and the whole bound over with leather or bladder.

The inspissated juices almost all attract moisture from the air, and soon become soft or even liquid. The extracts of the narcotics with chlorophylle dry gradually, and in the course of some years become very solid. This drying seems to favour the molecular attraction of their crystallizable salts, and we find in them crystals of common salt, oxalate of lime, nitrate, sulphate, and muriate of potass. Some extracts prepared by digestion or decoction soon become solid, almost brittle, as those which contain amylaceous matter, such as liquorice, bryony, sarsaparilla. Extracts prepared from dry vegetables generally preserve the degree of consistence given to them.

Extracts should be totally free from empyreuma, a sour, musty, or any foreign smell, and should not be black, but have a kind of fawn colour, although deep, should be uniform in appearance throughout, and should be soluble in water.

EXTRACTA PER AQUAM. *Ed.*
Extracts made with Water.

Having cut and bruised the substance from which the extract is to be made, pour upon it eight times its weight of distilled water. Boil to the consumption of one-half of the liquor, and strain it by strong expression. Evaporate the decoction immediately, to the consistence of thick honey, in a bath of water saturated with muriate of soda.

EXTRACTA. *Lond.*
Extracts.

In preparing all extracts, evaporate the fluid in a pan, placed in a water-bath, as quickly as possible, until it become of a proper thickness for forming into pills, stirring it constantly towards the end with a spatula.

Sprinkle a little Rectified Spirit on all softer extracts.

EXTRACTA SIMPLICIORA. *Dub.*
Simple Extracts.

ALL simple extracts, unless otherwise ordered, are to be prepared according to the following rule:

The vegetable matter is to be boiled in eight times its weight of water, to one-half; the liquor is then to be expressed, and, after the fæces have subsided, to be filtered; it is then to be evaporated with a heat between 200° and 212°, until it becomes thickish; and, lastly, it is to be evaporated in a vapour bath, and frequently stirred, until it acquire consistence *proper for* forming pills.

All extracts, when they begin to get thick, ought to be frequently stirred. They may be reduced to a proper thickness, at a moderate temperature, by means of a vapour bath.

They ought to be preserved as much as possible from the contact of the air, and the softer ones are to be sprinkled with rectified spirit.

In this manner are prepared the following officinal Extracts:

EXTRACTUM	Extract of
ALOES HEPATICÆ. *Dub.*	Hepatic aloes.
ANTHEMIDIS NOBILIS. *Ed.*	Chamomile dried flowers.
CHAMÆMELI. *Dub.*	
ARTEMISIÆ ABSINTHII. *Dub.*	Wormwood tops.

EXTRACTUM	Extract of
GENTIANÆ LUTEÆ. *Ed. Dub.*	Gentian root, sliced and bruised.
GLYCYRRHIZÆ GLABRÆ. *Dub.*	Liquorice root.
HÆMATOXYLI CAMPECHIANI. *Ed. Dub.*	Logwood rasped.
HELLEBORI NIGRI. *Ed.*	Black Hellebore root, bruised.
HUMULI LUPULI. *Dub.*	Strobiles.
PAPAVERIS SOMNIFERI. *Ed.*	Poppy capsules, bruised after taking out the seeds.
QUERCUS. *Dub.*	Oak bark.
RUTÆ GRAVEOLENTIS. *Ed.* RUTÆ. *Dub.*	Rue, herb.
SPARTII SCOPARII. *Dub.*	Tops.
TARAXACI. *Dub.*	Dandelion herb and root.

EXTRACTUM ALOES PURIFICATUM. *Lond.*
Purified Extract of Aloes.

Take of Socotorine aloes, in powder, one pound;
Boiling water, a gallon.

Macerate in a gentle heat for three days, then strain, and set it at rest till the fæces subside. Pour off the clear liquor, and evaporate to a proper thickness.

VERY little genuine socotorine aloes is found in the market. What is sold under that name is commonly hepatic aloes from the East Indies, purified either by the process described above, which however always renders it black, and minutely porous; or by merely softening it over steam, and pressing it through a hair-sieve, which separates the impurities accidentally mixed, and does not destroy its hepatic colour.

EXTRACTUM ANTHEMIDIS. *Lond.*
Extract of Chamomile.

Take of Chamomile flowers, dried, one pound;
Water, one gallon.

Boil down to four pints, and filter the liquor while hot. Then evaporate to a proper thickness.

EXTRACTUM CINCHONÆ. *Lond.*
Extract of Cinchona.

Take of Lance-leaved cinchona bark, bruised, one pound;
Water, one gallon.

Boil to six pints, and filter the liquor while hot. With the same quantity of water, and in the same manner, repeat the boiling and filtration four times. Then reduce all these liquors, mixed together, to a proper thickness, by evaporation.

This extract must be kept in two forms; one *soft*, and fit for making pills; the other *hard*, and pulverizable.

Dub.

Take of Crown cinchona, in coarse powder, one pound;
Water, six pints.

Boil, for a quarter of an hour, in a vessel almost covered; filter the decoction while hot through linen, and set it aside. Boil the residuum again in the same quantity of water, and filter it in the same manner. This may be repeated a third time. Mix all the decoctions, and reduce them to a proper degree of thickness by evaporation.

This extract is to be kept in two states; one *soft*, adapted for making pills; and the other *hard*, capable of being pulverised.

CADET DE VAUX got from boiling one pound of bruised cinchona bark for ten minutes in six pints of water, two ounces of a brownish, grumous extract. The same quantity gave him by infusion two ounces, two drachms of a smooth extract of a fine red colour. Guibourt's experiments did not correspond with these as to quantity, but completely as to quality.

EXTRACTUM COLOCYNTHIDIS. *Lond.* EXTRACT. COLOC. SIMPLEX. *Dub.*

Simple Extract of Colocynth.

Take of Pulp of colocynth, one pound;
Water, one gallon.

Boil to four pints, and filter the liquor while hot. Lastly, evaporate to a proper thickness.

MR PHILLIPS says, that it is scarcely possible to boil the colocynth in the assigned quantity of water, and that the extract obtained is remarkably spongy, and very soon becomes hard and mouldy.

This was not altogether the case in an experiment made by myself. Half a pound of colocynth apples had the seeds carefully picked out. They weighed 2770 grains, and boiled by themselves yielded almost nothing. The pith weighed 800 grains, was easily boiled in four pounds of water, but absorbed the whole of it. The decoction expressed contained no starch, although it gelatinized on cooling from the pectic acid, which Braconnot shewed to be one of its constituents. The residuum was boiled in four pounds of fresh water. The decoctions united yielded 360 grains of a pale brown, semitransparent, dry, elastic extract, of intense bitterness. 1000 parts of colocynth pulp yielded to M. Recluz, by infusion with water, 162; by digestion at 112°, 323; by decoction, 375; by maceration with alcohol of 30°, 205, and of 35°, 62.5 to 125.

EXTRACTUM GENTIANÆ. *Lond.*
Extract of Gentian.

Take of Gentian root, one pound;
Boiling water, one gallon.

Macerate for twenty-four hours; then boil down to four pints, and filter the liquor while still hot; lastly, evaporate it to a proper thickness.

GUIBOURT, as well as Cadet de Vaux, got both a larger quantity of extract from gentian root by infusion than by decoction, and the extract was smoother, more transparent, bitterer, and had more of the colour and smell of the root, so that there is no comparison between the two modes of extraction in this instance.

Off. Prep.—Pilulæ aloes comp. *D.*

EXTRACTUM GLYCYRRHIZÆ. *Lond.*
Extract of Liquorice.

Take of Liquorice root, sliced, one pound;
Boiling water, one gallon.

Macerate for twenty-four hours; then boil down to four pints, and filter the liquor while still hot; lastly, evaporate it to a proper thickness.

EXTRACTUM HÆMATOXYLI. *Lond.*
Extract of Logwood.

Take of Logwood, bruised, one pound;
Boiling water, one gallon.

Macerate for twenty-four hours, then boil to four pints.—Strain the liquor while hot, and evaporate to a proper consistence.

EXTRACTUM HUMULI. *Lond.*
Extract of Hops.

Take of Hops, four ounces;
Water, boiling, a gallon.

Boil down to four pints, strain the hot liquor, and evaporate it to a proper consistence.

IN the former edition 1809, the quantity of hops was half a pound, in regard to which Mr Phillips says that the proportion of water ordered was considerably too small. It has accordingly been corrected.

EXTRACTUM OPII AQUOSUM. *Dub.*
Watery Extract of Opium.

Take of Opium, sliced, two ounces;

Boiling water, one pint.

Triturate the opium in the water, for ten minutes; then, after waiting a little, pour off the liquor, and triturate the remaining opium with the same quantity of boiling water, pouring off the infusion in the same manner. This may be repeated a third time. Mix the decanted liquors, and expose the mixture to the air, in an open vessel, for two days. Lastly, filter through linen, and, by slow evaporation, form an extract.

EXTRACTUM OPII. *Lond.*
Extract of Opium.

Take of Opium, sliced, sixteen ounces;
Water, one gallon.

Add a small quantity of the water to the opium, and macerate for twelve hours, that it may soften; then, having gradually added the rest of the water, triturate them, until they become thoroughly mixed, and set the mixture at rest until the fæces subside. Then filter the liquor, and evaporate to a proper thickness.

THE London College gives directions also for removing all foreign matters from crude opium:

Separate opium very carefully from all heterogeneous matters, especially those adhering to it on the outside. Opium is to be kept in two states; one *soft*, fit for making pills; and another *hard*, dried in a water-bath, until it become pulverizable.

These directions appear to me highly judicious. Well-selected opium is more to be depended upon for uniformity of effect than any extract prepared from it. It never moulds, which the extracts often do; and for the purpose of making the preparations of opium, its previous purification is unnecessary, as all heterogeneous matters and impurities are separated during the process. Besides, purification gives great opportunity for the fraudulent employment of a very inferior article, and for direct adulteration.

Mr Phillips, however, prefers the preparing of an extract of opium, by first submitting it to the action of boiling water, as long as any portion of it continues to be dissolved, and then digesting the residuum in rectified spirit, and mixing the watery and alcoholic extracts thus obtained. He found, that 72 parts of opium, dried by steam till it became pulverizable, yielded to cold water 30 parts, then to boiling water 9, and, lastly, to alcohol 7. The cold infusion was of a deep brownish-red colour, remained transparent, and smelt strongly of opium; the decoction was of a pale brown colour, deposited on cooling the greater part of what had been dissolved, and had no smell of opium; and the tincture very much resembled common tincture of opium, and furnished, on the addition of water, an abundant yellowish-white precipitate. Dr Powell also says, that proof-spirit by heat dissolves 9-12ths of opium; and water, although heated, only 5-12ths.

Off. Prep. of hard opium.—Confectio opii, *D.* Pulv. cretæ comp. cum opio, *D.* Pulvis kino comp. *D.*

EXTRACTUM PAPAVERIS. *Lond.*
Extract of Poppy.

Take of Poppy heads, bruised, without the seeds, one pound;
Boiling water, a gallon.

Macerate for twenty-four hours; then boil to four pints; strain the liquor while hot; and evaporate to a proper thickness.

EXTRACTUM SARSAPARILLÆ. *Lond. Dub.*
Extract of Sarsaparilla.

Take of Sarsaparilla root, sliced, one pound;
Boiling water, one gallon.

Macerate for twenty-four hours; then boil down to four pints, and filter the liquor while hot; lastly, evaporate to a proper thickness.

EXTRACTUM SARSAPARILLÆ FLUIDUM. *Dub.*
Fluid Extract of Sarsaparilla.

Take of Sarsaparilla root, sliced, one pound.
Water, twelve pounds.

Boil together for an hour, and pour off the liquor. Add other twelve pounds of water, and repeat the boiling and effusion. Express the liquor strongly from the remaining matter. Set aside the mixed liquors until the dregs subside. Then evaporate them by continued ebullition to thirty ounces, and add two ounces of rectified spirit.

THE fluid extract of sarsaparilla is at present a fashionable remedy, as an alterative in syphiloid and hepatic diseases; that is, as a remedy from which no marked effects are expected, but which is supposed gradually to improve the impaired constitution. The good effects of such remedies are not easily ascertained, as the recovery may be chiefly owing to the regimen followed at the same time.

The fluid extract is of course less active than the soft, but it is also less liable to be injured by want of attention in the process, inducing empyreuma, and rendering the product inert.

EXTRACTUM STRAMONII. *Lond. Dub.*
Extract of Thorn Apple.

Take of Thorn apple seeds, one pound;
Boiling water, one gallon.

Macerate for four hours in a loosely covered vessel, (near the fire, *Lond.*); then take out the seeds, and bruise them in a stone mortar; when bruised, return them into the liquor. Then boil down to four pints, and filter (while still hot, *Lond.*) Lastly, evaporate to a proper consistence.

THE seeds of the stramonium contain the narcotic principle in an uniform state of concentration, and therefore answer well as the basis of its preparations. It was the extract of the seeds that Dr Marcet found so efficacious in allaying pain, and I have found it equally successful.

EXTRACTUM TARAXACI. *Lond.*
Extract of Dandelion.

Take of Fresh dandelion root, bruised, one pound;
Boiling water, one gallon.

Macerate for twenty-four hours; then boil to four pints, and filter the liquor while hot; lastly, evaporate to a proper thickness.

THIS is another of those fashionable alteratives, which often serve to amuse the patient, or give time to the practitioner, although I by no means intend to deny its efficacy in some cases. It is chiefly used in what are called hepatic disorders.

Spirituous Extracts.

Alcohol is much too expensive to be employed as a menstruum for obtaining extracts, except in those cases where water is inadequate or unfit to the purpose. These cases are,

1*st*, When the nature of the extract is very perishable when dissolved in water, so that it is liable to be decomposed before the evaporation can be completed, especially if we cannot proceed immediately to the evaporation. 2*dly*, When water is totally incapable of dissolving the substance to be extracted; and, 3*dly*, When the substance extracted can bear the heat of boiling alcohol without being evaporated, but would be dissipated by that of boiling water; that is, when it requires a heat greater than 176°, and less than 212°, for its evaporation. 4*thly*, When water dissolves a large proportion of inert principles, as starch and gum, while the active principle is soluble in alcohol.

In the first case, the alcohol employed may be very weak, or rather, the addition of a small proportion of alcohol to water will be sufficient to retard or prevent the decomposition of the solution. In the second case, the alcohol need not be very strong, because it is capable of dissolving resinous substances, although diluted with a considerable proportion of water. In this way the alcoholic extract of some aromatic substances, as cinnamon, lavender, rosemary, retain a considerable degree of their fine flavour. In the third case, the alcohol must be perfectly free from water, because the heat necessary to evaporate it at the end of the process would frustrate the whole operation. Hence, also, the subject itself ought always to be dry: those substances which lose their virtue by drying, lose it equally on being submitted to this treatment with the purest alcohol. In the last case, the strength of the alcohol must be adapted to the nature of the substance to be operated on. Those whose virtue resides in a purely resinous principle, as jalap, ought to be treated with highly rectified alcohol, sp. gr. 850, or 35° B., while rhubarb, cinchona, saffron, readily yield their active principles to a spirit of 22° B. or sp. gr. 920. Also bitter, poisonous and narcotic plants, when well dried, yield a much more active extract to weak spirit, than that obtained by inspissating their expressed and depurated juice. Indeed, it is more active, in general, than that got by highly rectified spirit, because, although the latter is free from gummy principles, their absence is more than compensated by the greater proportion of green and oily matter which the stronger alcohol dissolves, and is scarcely touched by the weaker.

The *Pharmacopée Raisonnée* directs that rectified alcohol be used in preparing the extracts of black hellebore, jalap, nux vomica, Saint Ignatius's beans, and of hops, and proof-spirit for all the others.

The alcohol employed in all these cases should be perfectly free from any unpleasant flavour, lest it be communicated to the extract.

The inspissation of these alcoholic solutions should be performed from the beginning in the gentle heat of a water-bath. We need not suffer the alcohol to evaporate in the air: the greatest part of it may be recovered by collecting the vapour in common distilling vessels. If the distilled spirit be found to have brought over any flavour from the subject, it may be advantageously reserved for the same purposes again.

When diluted alcohol is employed, the distillation should only be continued as long as alcohol comes over; and the evaporation should be finished in wide open vessels, as the watery extracts.

EXTRACTA PER AQUAM ET ALCOHOL. *Ed.*
Extracts made with Alcohol.

Upon the substance to be extracted, in powder, pour four times its weight of stronger alcohol. Digest for four days, and pour off the tincture. Boil the residuum in five pounds of distilled water, for fifteen minutes, and filter the decoction, boiling hot, through linen. Repeat this decoction, and filtration, with the same quantity of distilled water, and reduce the liquor, by evaporation, to the consistence of thin honey. Draw off the alcohol from the tincture, by distillation, until it also become thick: then mix the liquors, thus inspissated, and evaporate them in a bath of boiling water, saturated with muriate of soda, to a proper consistency.

In this way are prepared,

EXTRACTUM CINCHONÆ LANCIFOLIÆ. *Ed.*
Extract of Cinchona, from the bark.

EXTRACTUM CONVOLVULI JALAPÆ. *Ed.*
Extract of Jalap, from the root.

EXTRACTUM CINCHONÆ RESINOSUM. *Lond.*
Resinous Extract of Cinchona.

Take of Lance-leaved cinchona, bruised, two pounds;
Rectified spirit of wine, one gallon.

Macerate for four days, and strain; distil the tincture, in a water-bath, to a proper thickness.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM. *Lond. Dub.*
Compound Extract of Colocynth.

Take of Pulp of colocynth, sliced, six ounces;
Socotorine (Hepatic *Dub.*) aloes, in powder, twelve ounces;
Scammony, in powder, four ounces;
Cardamom seeds, powdered, one ounce;
Hard soap, three ounces;
Proof-spirit, one gallon.

Macerate the pulp of colocynth in the spirit, with a gentle heat, for four days. Strain the liquor, and add to it the aloes, scammony and soap. Then evaporate to a proper thickness, (for making pills, *Dub.*), adding, towards the end of the operation, the cardamom seeds.

EXTRACTUM JALAPÆ. *Lond.*
Extract of Jalap.

Take of Jalap root, in powder, one pound;

Rectified spirit, four pints;
Water, one gallon.

Macerate the jalap in the spirit, for four days, and pour off the tincture. Boil the residuum in the water to two pints. Then filter the tincture and decoction separately; evaporate the latter, and distil the former until both grow thick; lastly, mix the extract with the resin, and evaporate to a proper thickness, (in a water bath, *Dub.*)

(This extract is to be kept in two states; one *soft*, proper for making pills, and one *hard* and pulverizable, *Lond.*)

Off. Prep. of the hard extract.—Pulvis scammonii comp. *D.*

EXTRACTUM NUCIS VOMICÆ. *Dub.*
Extract of Nux Vomica.

Take of Nux vomica, rasped, eight ounces;
Weaker spirit, two pints.

Digest in a close vessel for three days; filter the liquor, and express the remainder by means of a press. Add to the residuum one pound and a half of weaker spirit; digest the mixture for three days, and express the remainder. Reduce the mixed tinctures by distillation to one-fourth, and evaporate to a proper thickness.

THE difference in degree of action between a spirituous and watery extract of nux vomica is very remarkable. The latter, carefully prepared under my own direction, I have given in large doses without producing any notable effect; whereas the former, as prepared by M. Pelletier of Paris, in doses of half a grain, or a grain three times a-day, rarely fails to produce that singular tetanic state, first pointed out by M. Magendie. I even think that this alcoholic extract is preferable to pure strychnia, in respect that it is more manageable, and much less costly.

EXTRACTUM RHEI. *Lond Dub.*
Extract of Rhubarb.

Take of Rhubarb root, in powder, one pound;
Proof-spirit, one pint;
Water, seven pints.

Macerate, with a gentle heat, for four days; then filter, and set it aside until the fæces subside. Pour off the liquor clear, and evaporate to a proper thickness.

RHUBARB yields nearly the same quantity of extract to infusion and to decoction, but the former is infinitely preferable. It is finer, more soluble in water, less mucilaginous, and certainly more active. By decoction the starch is dissolved, which forms with the tannine a compound insoluble when cold, and an equal quantity of the active principle is combined with the woody fibre, and is not dissolved.

All these various extracts are supposed to contain the virtues of the substances from which they are prepared, in a very pure and concentrated form.

EXTRACTUM LACTUCÆ. *Lond.*

Extract of Lettuce.

Take of Fresh lettuce leaves, one pound.

Bruise in a stone mortar, sprinkling on a little water, and evaporate it without separating the sediment, until it acquire the proper consistence.

THIS preparation should have been inserted among the inspissated juices, as no menstruum is applied to extract the soluble parts. It differs totally from the concrete juice which exudes from incisions, and consists chiefly of the common sap inspissated, containing very little of the milky secretion, and will have the same relation to *Lactucarium*, that the expressed juice of the poppy plant inspissated would have to *Opium.*

The following table, differently arranged, from the Pharmacopée Rationelle, shews the quantity of extract in 1000 parts, obtained from a number of simples, by solvents of different kinds:

Name.	Part.	Water.	Alcohol.
Acacia Catechu,	Extract.	760	
Aconit. Napell.	Leaves dry.		at 22° 225
Angustura vera,	Bark.		do. 250
Anthemis nob.	Flowers dry.	285	do. 315
Arbut. Uva Ursi,	Leaves dry.	285	
Arnica mont.	Flowers dry.	200	
Asparag. sativ.	Root dry.	110	
Artemis. Absinth.	Leaves dry.	200	do. 220
Atropa Bellad.	Leaves dry.	125	do. 220
Borago offic.	Leaves dry.	85	
Carduus benedict.	Leaves dry.	180	
Cassia fistula,	Pods dry.	190	
——— Senna,	Leaves dry.	250	do. 210
Chiron. Centaur.	Summits dry.	250	
Cichor. Intyb.	Leaves dry.	230	
———————	Root dry.	120	
Cinchona pall.	Bark.	200	at 22° 170
———— flava,	Do.	80	do. 220
———— rubra,	Do.	80	do. 200
Conium mac.	Leaves dry.		do. 240
Conv. Jalapa,	Root dry.	440	at 36° 250

Name.	Part.	Water.	Alcohol.
Crocus sativ.	Stigm.	510	at 33° 500
Crot. Cascaril.	Bark.	65	do. 120
———	———		at 22° 80
Cucum. Coloc.	Ft. clean.	135	do. 130
Curcum. longa,	Root dry.	115	do. 130
Cynod. Dactyl.	Root dry.	85	
Cynogloss. off.	Root dry.	375	
Digit. purpur.	Leaves dry.		do. 270
Fumaria off.	Plant dry.	200	
Gentiana lutea,	Root dry.	330	
Glycyr. glabra,	Root dry.	150	
———	Extract.	650	
Guaiac. off.	Wood.	23	at 22° 190
Helleb. niger,	Root dry.	180	do. 140
Humul. Lupul.	Strobile.	110	do. 230
———	———		at 33° 170
Hyosc. niger,	Leaves dry.		at 22° 280
——— albus,	Do.		do. 220
Inula Helen.	Root dry.	210	
Ipecacuan.	Root dry.	380	do. 220
Junip. com.	Fruit.	150	
Kramer. triand.	Root dry.	170	do. 300
Myrrha,		850	do. 250
Narcissus pseudonar.	Leaves dry.	140	
Nux vomica,	Seeds.	40	at 33° 95
Opium elect.		530	at 22° 550
———			wine 635
Papav. somn.	Capsule.	90	
Pareira brava.	Root dry.	125	at 22° 120
Rheum,	Root dry.	500	at 33° 440
Rhus radicans,	Leaves dry.	105	at 22° 240
Rumex Patient.	Root dry.	185	
Ruscus aculeat.	Root dry.	170	
Quassia amara,	Wood.	90	at 22° 20
Scilla maritim.	Bulb dry.	600	do. 600
Smilax Sarsap.	Root dry.	125	
Solan. Dulcam.	Twigs.	150	
Valerian. sylv.	Root dry.	160	do. 120

A more extensive table, exhibiting also the changes which extracts undergo by keeping, has been published by M. Recluz in the *Journ. de Pharmacie*, and in the *Diction. des Drogues*.

QUININÆ SULPHAS. *Dub.*
Sulphate of Quinine *.

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* *Syn.* Chinium sulphuricum, Chininum sulphuricum, Sulphas quinicus.

Take of Yellow bark in coarse powder, four pounds;
Distilled water, eight pints;
Dilute sulphuric acid, two ounces.

Mix and digest, in a proper vessel, with a heat from 200° to 212°, with frequent agitation, for four hours, and then filter. Mix the residuum with an equal quantity of water, and filter. Repeat this a third time. Add to the mixed solutions recently burnt and slaked quicklime as much as to neutralize the acid. Separate the precipitate formed, by bibulous paper. Add to this three pints of rectified alcohol; digest them together, with frequent agitation, for six hours, and filter. Add an equal quantity of rectified spirit to the powder which remains, and filter. Repeat this a third time. Mix the tinctures, and evaporate them almost to dryness in a vapour bath. Gradually add to the residuum dilute sulphuric acid in such quantity, that the liquor contain a slight excess of acid. Lastly, crystallize by evaporation and refrigeration.

The hypothesis of early chemists, of the properties of vegetables being owing to essential salts, which they in vain endeavoured to extract, has, by the skill of the moderns, been fully realized, so that we are now able to condense in a few grains the whole power of several ounces of the most valuable drugs.

There are various methods of procuring these essential extracts. Of one of these, the officinal process is an example, although somewhat deficient in detail. I shall however explain its theory. The active principle of yellow bark is the supercinchonate of quinia, a salt which is soluble both in water and in alcohol; but by the simple action of these solvents, neither the whole quantity contained in the bark is obtained, nor can it be procured even tolerably pure. This is owing to the intimate combination, or strong adhesion of organic principles to each other; so that substances in themselves soluble, partially remain combined with insoluble principles, and, *vice versa*, insoluble principles are partially dissolved by their union with soluble principles. One mode of effecting the more complete separation is to combine the principle to be extracted with a substance of more decided chemical reaction than what organic principles in general possess. Thus, in the example before us, sulphuric acid has a much more decided reaction with quinia than cinchonic acid has, and therefore it separates it more completely from the principles with which it was organically combined in the bark. The consequence is, that both a larger quantity of quinia is dissolved, and it is purer or less contaminated with foreign principles. By digesting the bark repeatedly with dilute sulphuric acid, a solution of impure sulphate of quinia is obtained. The next step in the process is to separate the quinia from the sulphuric acid; and as quinia is insoluble in water, it is thrown down in the form of a powder, when any base having a stronger affinity for sulphuric acid is added. Lime is chosen for that purpose by the college; but as its sulphate is also very sparingly soluble, the precipitate is a mixture of quinia and sulphate of lime. In this step of the process, considerable advance is made towards the purification of the quinia, because part of the impurities remain in solution. The next step is to separate the quinia from the sulphate of lime, and this is effected by the agency of rectified spirit, which dissolves the former, and leaves the latter untouched. There is in this way procured an alcoholic solution of quinia in a tolerable state of purity. By expelling the spirit, the solution of quinia is concentrated, to which a slight excess of sulphuric acid is added; and sulphate of quinia, being a crystallizable salt, crystallizes by proper treatment, and by the very act of crystallization excludes, in a great measure, the impurities which still adhere to the quinia.

I have already said, that the officinal directions are deficient in detail; and it may not be superfluous to give the process of M. Henry junior, as modified by M. Bernardet, which seems to be considered by the French pharmaceutists as the most approved. Take 2000 parts of yellow cinchona bark, *China regia, (Cinchona cordifolia,* L.) After reducing it to a sufficiently fine powder, boil it for an hour with 15,000 parts of water, in which have been previously mixed 128 parts of sulphuric acid at sp. gr. 1847. Strain the acid decoction obtained through linen, and treat the residuum successively by new quantities of boiling acidulated water, until all the bitter principle be extracted from the bark; which requires the decoction to be repeated seven times. Add about 500 parts of newly slaked and sifted lime to these decoctions while still boiling hot. Allow them to cool completely, in order to collect the deposit. Wash and divide this into small masses; dry it quickly by a stove, and reduce it to a fine powder. Digest it with alcohol of 36° sp. gr. ·847, at a heat of 60°, (167, F.) Repeat these digestions as long as the alcoholic solutions are bitter; filter and draw off by a water-bath the whole of the alcohol employed. Pour on the viscous residuum a sufficient quantity of alcohol, about 100 parts, which dissolves it completely and instantly. Mix this with 3000 parts of water strongly acidulated and previously heated in a water-bath, so as to render the liquid sufficiently acid to tinge turnsole paper of a deep cherry red, and then filter. Boil the solution with commercial animal charcoal, which suffices to discolour it, and at the same time to saturate the excessive acid by means of the carbonate of lime which it contains. On filtering the solution anew, the sulphate of quinia which the viscous matter contained is obtained in the utmost state of purity and whiteness of which it is susceptible. Separate this from the mother water, and put it to dry in a stove at the temperature of 25° or 30°, (90° to 100° F.) The product should be about 64 parts.

Quinia is capable of combining with two proportions of sulphuric acid, differing in solubility and crystallization. The neutral sulphate, which is the most common, is in very fine white, silky, acicular crystals, very sparingly soluble in cold water, more soluble in boiling water, totally soluble in acidulated water and in alcohol, and phosphorescent at 212°. The acid sulphate is much more soluble in water, and crystallizes in pointed prisms, commonly larger and more determinate than the preceding. It is often formed in the process for preparing sulphate of quinia, when too much acid has been added, and thus remains dissolved in the mother water along with the sulphate of cinchonia; but it may be always made to crystallize, by adding a little animal charcoal, which saturates the superfluous acid, and precipitates it in the form of sulphate of lime. According to M. Robiquet, the constituents of these two sulphates are,—

	Neutral.	Acid.
Sulphuric acid,	10	19.1
Quinia,	80.9	63.5
Water,	9.1	17.4

Sulphate of quinia is often adulterated with various substances, such as acicular sulphate of lime, mannite, sugar, stearine, &c. The first is detected by alcohol, which does not dissolve it, or by calcination, which leaves it in the form of a white residuum. Sugar and mannite are detected by precipitating a solution of the sulphate of quinia by carbonate of potass, separating the quinia by filtration, evaporating to dryness, and treating the residuum by alcohol at 30°, which dissolves the sugar and mannite. Stearine is detected by acting upon the adulterated sulphate of quinia with water acidulated by sulphuric acid, and which does not dissolve the stearine.

Med. use.—The sulphate of quinia may be truly denominated the quintessence of Peruvian bark, and from this name its action may be readily inferred. It possesses all the medical virtues of the drug, concentrated in a very small volume, which in this instance is an immense advantage, as the inert or offensive principles exist in so large proportion, that they often prevent the bark being administered in substance in sufficient quantity to produce its curative effects. This is not so remarkably the case in regard to some of the other alkaloids, as, for example, morphia, since select opium produces its full action in a dose already sufficiently small, and hence morphia, or its salts, will never be generally employed.

Sulphate of quinia, on the contrary, is already in very general use, and will always continue to be one of the most valuable additions which the practice of medicine has derived from the science of chemistry. It may be used in every case in which Peruvian bark in substance is proper. In some instances its beneficial effects may be particularized. Intermittent fevers, in this country, rarely resist its administration, in doses of three to five grains, every two or three hours during the interval. Notwithstanding the recommendation by Dr Haygarth of cinchona in acute rheumatism, I could never satisfy myself of its good effects, and from theory was doubtful of its fitness for the disease; but my want of success was owing to my not having given it in efficient doses, which the discovery of sulphate of quinia has enabled me to do. This I have repeatedly given, and with complete success, in very acute cases, in doses of five grains four times a-day. It operates as a most powerful sudorific, and generally induces considerable debility. It is used also with success in neuralgia, in hæmorrhagies and fluxes.

From its extreme bitterness, it is seldom exhibited in solution. Most commonly the salt is rubbed up with a little sugar, to reduce it to fine powder, and taken as a bolus, mixed up with a little currant jelly; or it is made into a pill mass, with crumb of bread and mucilage, or any of the soft extracts. From its solubility being increased by acids, it is very advisable to take, after each dose of sulphate of quinia, a few drops of dilute sulphuric acid in a glass of water, which also serves to wash the bitter taste from the mouth.

GUMMI RESINÆ. *Lond.*
Gum Resins.

Those gum-resins are to be reckoned the best which are selected so pure that they do not stand in need of purification. But if they seem impure, boil them in water until they grow soft; then squeeze them through a canvas bag, by means of a press. Let them remain at rest till the resinous part subside; then evaporate in a water-bath the part of the water decanted off; and towards the end of the evaporation mix the resinous part with the gummy into a homogeneous mass.

Gum-resins which melt easily may be purified by putting them into an ox-bladder, and holding it in boiling water till they become so soft that they can be separated from impurities by pressing them through a hempen cloth.

Of the two processes here described, the latter, when applicable, is to be preferred, as altering least the composition of the gum resin. The former is objectionable.

As one, and perhaps the most active, constituent of these substances, is of a volatile nature, it is evident that it must be, in a great measure, dissipated during the evaporation. Gummy resins, which stand in need of it, to give them an apparent degree of purity, should not be admitted into the shop of the apothecary. Besides, many of the impurities which they usually contain are easily separated, in compounding the preparations or extemporaneous prescriptions into which they enter.

STYRAX PURIFICATA. *Lond.*
Purified Storax.

Dissolve storax in rectified spirit of wine, and filter; afterwards reduce the balsam to a proper thickness, by distilling off the spirit with a gentle heat.

Storax is a balsam, or combination of resin and benzoic acid, both of which are soluble in alcohol, and neither of them volatile in the heat necessary for evaporating alcohol. The process for purifying it is therefore not liable to any chemical objections.

Solution even in rectified spirit is insufficient for obtaining resins in a state of purity, as almost always the deliquescent salts, and colouring principles of vegetables, are equally soluble in water and in alcohol. As an example of the mode of procuring pure resins, we may give that much employed on the Continent for that of jalap: Take jalap root, coarsely powdered; put it into a tin vessel, with four or five times its weight of rectified spirit; put on the cover, and heat it gently to ebullition; let it stand twenty-four hours; express the tincture, and filter; treat the residuum in the same manner with fresh alcohol a second and a third time; unite the tinctures, and distil off two-thirds of the spirit in a water-bath; add to the residuum twenty or thirty times its weight of water; let the mixture cool perfectly; spread upon plates the soft and plastic resin which will be deposited, and expose it to the heat of the stove until it become dry and brittle.

RESINA FLAVA. *Dub.*
Yellow Resin.

This remains in the retort after the distillation of oil of turpentine.

TURPENTINES are combinations of volatile oil and resin, which are easily separated by distillation. The process, however, cannot be carried so far as to separate the whole of the oil, without charring and burning part of the resin. In this state it has a brown colour, and a certain degree of transparency, and is well known under the name of Colophony or Fiddlers Rosin. But if water be added to the residuum of the distillation, and be thoroughly mixed with it by agitation, the mass becomes opaque, and is called Yellow Rosin. In the process of the Dublin College, the resin is obtained merely as a bye product in the distillation of oil of turpentine; but many turpentines contain so little oil, that it is not worth the trouble of saving it. From these, rosin (*Terebinthine cuite*) is however sometimes prepared, by putting it into a well-tinned vessel with water, and boiling the mixture until a little turpentine taken out, and thrown into cold water, become dry and brittle. It is then taken out of the water, and put into pots, after having worked it for some time.

The researches into the nature of resins by M. Bonastre deserve notice. He considers them to consist, 1. of a volatile oil; 2. of an acid; 3. of a resin; 4. of a sub-resin; 5. of bitter extractive containing some salts. The examination of what he calls sub-resins is particularly interesting, although they were previously distinguished by the German pharmaceutists by the title of *hard resins.* They are characterised by being entirely destitute of volatile oil, being free from acid, without, however, becoming alkaline, being soluble in alcohol, ether and volatile oils, only when boiling hot, assuming in some species a well-determined crystalline form, not forming soaps with the caustic alkalies, and, lastly, by possessing in some instances a phosphorescent property.

CHAP. XXXVI.—POWDERS.

THIS form is proper for such materials only as are capable of being sufficiently dried to become pulverizable, without the loss of their virtue. There are several substances, however, of this kind, which cannot be conveniently taken in powder; bitter, acrid, fetid drugs are too disagreeable; emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth; potash deliquesces when exposed to the air; volatile alkali exhales, and soda effloresces. Many of the aromatics suffer a great loss of their odoriferous principles when kept in powder, as in that form they expose a much larger surface to the air.

MM. Henry and Guibourt have given us an useful table of the product obtained by powdering 1000 parts of the following substances.

Roots.		*Flowers.*	
Jalap,	940	Chamomile,	850
Rhubarb,	920	Red rose,	820
Colomba,	900	Saffron,	800
Marshmallow,	900	Wormseed,	800
Liquorice,	900	*Fruits.*	
Valerian, wild,	860	Mustard seed,	950
Elecampane,	850	Sabadilla,	900
Gentian,	850	Fennel,	900
Florentine orris,	850	Black pepper,	900
Rhatany,	850	Anise,	875
Calamus aromat.	840	Nux vomica,	850
Snake root,	800	Lemon peel,	800
Ipecacuan,	750	Phellandrium,	700
Cynoglose,	700	Colocynth,	500
Bulbs.		*Vegetable Products.*	
Squill,	820	Aloes,	960
Barks.		Tragacanth,	940
Simarouba,	900	Opium,	930
Yellow cinchona,	900	Gum arabic,	925
Cinnamon,	890	Scammony,	915
Red cinchona,	880	Catechu,	900
Pale cinchona,	875	Extract of liquorice,	810
True angustura,	825	*Animal Substances.*	
Leaves.		Castor,	900
Blessed thistle,	800	Cantharides,	850
Hemlock,	800	Slaters,	850
Fumitory,	800	*Mineral Substances.*	
Savine,	800	Red oxide of mercury,	980
Digitalis,	790	White oxide of arsenic,	950
Belladonna,	785	Sulphuret of antim.	950
Senna,	720	Red sulph. of mercury,	950
Henbane, ?	530	Tin,	825

The loss during pulverization arises from three causes; 1*st*, The hygrometric water driven off from vegetable and animal substances by the heat of the stove in drying them, but which they partly recover in the boxes or bottles in which they are kept; 2*dly*, The woody or bony residuum which remains after pulverization, and is rejected as inert; 3*dly*, The loss by the manipulation. The last depends upon the skill with which the operation is performed; but the loss arising from the two first causes is inevitable; and although they augment the price of the product, they, at the same time, increase its efficacy, and improve the remedy.

The dose of powders, in extemporaneous prescription, is generally about half a drachm: it rarely exceeds a whole drachm; and is not often less than a scruple. Substances which produce powerful effects in small doses are not exhibited in this form, unless their bulk be increased by additions of less efficacy: those which require to be given in larger doses are better fitted for other forms.

The most useful vehicle for taking the lighter powders is any agreeable thin liquid. The ponderous powders, particularly those prepared from metallic substances, require a more consistent vehicle, as syrups or conserves; for from thin ones they soon subside. Resinous substances, likewise, are most commodiously taken in thick liquors; for in thin ones they are apt to run into lumps, which are not easily diffused.

PULVERES. *Dub.*
Powders.

Substances to be powdered, previously dried, are to be beaten in an iron-mortar. The powder is then to be separated, by shaking it through an hair-sieve, and is to be kept in close vessels.

PULVIS ALOES CUM CANELLA. *Dub.*
Powder of Aloes with Canella.

Take of Hepatic aloes, one pound;
White canella, three ounces.
Powder them separately, and then mix them.

THIS was formerly well known by the title of *Hiera Picra*. The spicy canella acts as a corrigent to the aloes, but the compound is more adapted to the form of pills than of powder.

PULVIS ALOES COMPOSITUS. *Lond. Dub.*
Compound Powder of Aloes.

Take of Socotorine (Hepatic *Dub.*) aloes, one ounce and a half;
Gum-resin guaiac, one ounce;
Compound powder of cinnamon, half an ounce.

Powder the aloes and guaiac separately; then mix the compound powder of cinnamon with them.

This powder is supposed to combine the sudorific effects of the guaiac with the purgative of the aloes.

PULVIS ALUMINIS COMPOSITUS. *Ed.*
Compound Powder of Alum.

Take of Alum, four parts;
Kino, one part.

Rub them together to a fine powder.

This powder is composed of two very powerful astringents, but we doubt whether they be combined with propriety; at least it is certain that a solution of alum is decomposed by a solution of kino.

PULVIS AROMATICUS. *Dub.*
Aromatic Powder.

Take of Cinnamon, two ounces;
Smaller cardamom seeds, husked,
Ginger, of each one ounce;
Long pepper, one drachm.

Rub them together to a powder.

Ed.

Take of Cinnamon bark,
Smaller cardamom seeds,
Ginger root, each equal parts.

Reduce them to a very fine powder, which is to be kept in a glass vessel, well closed.

PULVIS CINNAMOMI COMPOSITUS. *Lond.*
Compound Powder of Cinnamon.

Take of Cinnamon bark, two ounces;
Cardamom seeds, an ounce and a half;
Ginger, one ounce;
Long pepper, half an ounce.

Reduce them together to a very fine powder.

These compositions are hot carminatives. The dose is from ten grains to a scruple and upwards. The first and third, from the long pepper which they contain, are more pungent than the second.

PULVIS ASARI COMPOSITUS. *Ed.*
Compound Powder of Asarabacca.

Take of The leaves of asarabacca, three parts;
——— marjoram,
Flowers of lavender, of each one part.
Rub them together to powder.

Dub.

Take of Dried leaves of asarabacca, one ounce;
Lavender flowers, dried, one drachm.
Powder them together.

THESE are agreeable and efficacious errhines. They are often employed with great advantage in cases of obstinate headach, and of ophthalmia resisting other modes of cure. Snuffed up the nostrils, to the extent of five or six grains at bed-time, they will operate the succeeding day as a powerful errhine, inducing frequent sneezing, and likewise a copious discharge.

PULVIS CARBONATIS CALCIS COMPOSITUS. *Ed.*
Compound Powder of Carbonate of Lime.

Take of Prepared carbonate of lime, four ounces;
Nutmeg, half a drachm;
Cinnamon bark, one drachm and a half.
Reduce them together to powder.

PULVIS CRETÆ COMPOSITUS. *Lond. Dub.*
Compound Powder of Chalk.

Take of Prepared chalk, half a pound;
Cinnamon bark, four ounces;
Tormentil root,
Gum arabic, of each three ounces;
Long pepper, half an ounce.
Reduce them separately to a very fine powder, and mix them.

THE addition of the aromatics coincides with the general intention of the remedy, which is indicated in weakness and acidity of the stomach, and in looseness from acidity.

Off. Prep.—Pulvis cretæ comp. cum opio, *L. D.*

PULVIS CRETÆ COMPOSITUS CUM OPIO. *Lond. Dub.*
Compound Powder of Chalk with Opium.

Take of Compound powder of chalk, six ounces and a half;
Hard opium, in powder, four scruples.
Mix them.

THE addition of the opium adds to the efficacy of the chalk, when diarrhœa proceeds from irritation of the intestinal canal. Two scruples contain a grain of opium.

PULVIS CONTRAYERVÆ COMPOSITUS. *Lond.*
Compound Powder of Contrayerva.

Take of Contrayerva root, in powder, five ounces;
Prepared oyster-shells, one pound and a half.
Mix them.

THIS composition is quite obsolete. It may be considered as another form of exhibiting carbonate of lime with a weak aromatic.

PULVIS IPECACUANHÆ ET OPII. *Ed.*
Powder of Ipecacuan and Opium.

Take of Ipecacuan root, in powder,
Opium, of each one part;
Sulphate of potass, eight parts.
Triturate them together into a fine powder.

PULVIS IPECACUANHÆ COMPOSITUS. *Lond. Dub.*
Compound Powder of Ipecacuan.

Take of Ipecacuan root, in powder,
Hard opium, (Turkey opium, *Dub.)* in powder, each one drachm;
Sulphate of potass, in powder, one ounce.
Mix them. Rub the sulphate of potass with the opium, and then mix in the ipecacuan.

IN this composition the sulphate of potass is probably added to assist in dividing the opium, when it is not previously powdered, and to give sufficient bulk to a dose of the active ingredients. Dover's original formula, which has been adopted into the Parisian Codex, was more complex. Four parts of sulphate of potass and as much of nitre were put into a crucible, and melted together. The mass was then finely powdered. To this was added one part of opium, sliced, and the whole triturated to a powder, with which were, lastly, mixed one part of ipecacuan, and one of liquorice root, both in powder.

Med. use.—As it is, this powder is one of the most certain sudorifics, and as such was recommended by Dr Dover in doses of from 40 to 60 or 70 grains, as an effectual remedy in rheumatism. Modern practice confirms its reputation, not only in rheumatism, but also in dropsy, and several other diseases, where it is often difficult, by other means, to produce a copious sweat. The dose is from five to twenty grains, according as the patient's stomach and strength can bear it. It is proper to avoid much drinking immediately after taking it, otherwise it may be rejected by vomiting before any other effects are produced. Ten grains of the compound powder contain one of opium and one of ipecacuan, which may be considered as a full dose of the former, but not above the fifth part of an emetic dose of the latter. Accordingly, when I have not thought it advisable to increase the dose of the opium, I have frequently increased the dose of the ipecacuan with good effect.

PULVIS JALAPÆ COMPOSITUS. *Ed. Dub.*

Compound Powder of Jalap.

Take of Jalap root, in powder, one part, (half a pound, *Dub.*);
Supertartrate of potass, two parts, (one pound, *Dub.*)
Grind them together to a very fine powder.

THE pharmaceutic use of the tartar in this preparation is to assist in dividing the jalap; and therefore they are directed to be triturated together, and not separately, but it also modifies its effect.

PULVIS KINO COMPOSITUS. *Lond. Dub.*

Compound Powder of Kino.

Take of Kino, fifteen drachms;
Cinnamon, half an ounce;
Hard opium, one drachm.
Reduce them separately to a very fine powder, then mix them.

THIS is a convenient officinal preparation. It is anodyne and astringent, containing one part of opium in twenty.

PULVIS OPIATUS. *Ed.*

Opiate Powder.

Take of Opium, one part;
Prepared carbonate of lime, nine parts.
Rub them together to a fine powder.

PULVIS CORNU CERVI CUM OPIO. *Lond.*

Powder of Hartshorn with Opium.

Take of Hard opium, in powder, one drachm;
Hartshorn, burnt and prepared, one ounce;
Cochineal, in powder, one drachm.

IN these powders the opium is the active ingredient; and it is immaterial whether the phosphate or carbonate of lime be used to facilitate its mechanical division.

PULVIS SALINUS COMPOSITUS. *Ed. Dub.*
Compound Saline Powder.

Take of Muriate of soda, (purified, *Dub.*),
Sulphate of magnesia, of each four parts;
Sulphate of potass, three parts.

Dry the salts with a gentle heat, reduce them to fine powder separately, then rub them together, and keep the mixture in a well-corked phial.

HOWEVER we may explain it, there is little doubt that mixtures of substances of similar characters have often a better effect than either of the ingredients singly, as is clearly shewn in the superior efficacy of the natural mineral waters. This mixture of salts acts very pleasantly in costive habits, being taken to the extent of a tea-spoonful in half a pint of water before breakfast.

PULVIS SCAMMONII COMPOSITUS. *Dub. Lond.*
Compound Powder of Scammony.

Take of Scammony,
Hard extract of jalap, of each two ounces;
Ginger root, half an ounce.

Reduce them separately to a very fine powder, and mix them.

Ed.

Take of Resin of scammony,
Supertartrate of potass, equal parts.

Rub them together to a very fine powder.

IN the former of these compositions, the scammony is combined with another purgative little less active than itself, and in the latter with one much less so; which difference must be attended to in prescription. The ginger in the former is an useful addition, and will render it less apt to gripe.

PULVIS SENNÆ COMPOSITUS. *Lond.*
Compound Powder of Senna.

Take of Senna leaves,
Supertartrate of potass, of each two ounces;
Scammony gum resin, half an ounce;
Ginger, two drachms.

Triturate the scammony by itself, reduce the rest together into a very fine powder, and then mix.

THIS powder is given as a cathartic, in the dose of two scruples or a drachm. The scammony is used as a stimulus to the senna powder; the quantity of the latter necessary for a dose, when not assisted by some more powerful substance, being too bulky to be conveniently taken in this form. The ginger is added to make it sit easier on the stomach, and gripe less.

PULVIS TRAGACANTHÆ COMPOSITUS. *Lond.*
Compound Powder of Tragacanth.

Take of Tragacanth, powdered,
Gum arabic, powdered,
Starch, of each one ounce and a half;
Refined sugar, three ounces.

Powder the starch and sugar together; then add the tragacanth and gum arabic, and mix.

THIS composition is serviceable in hectic cases, tickling coughs, strangury, some kind of alvine fluxes, and other disorders proceeding from diseased mucous membranes with acrid or morbid secretion. The dose is from half a drachm to two or three drachms, which may be frequently repeated.

PULVIS PRO CATAPLASMATE. *Dub.*
Powder for Cataplasms.

Take of Linseed oil cake, one part;
Oatmeal, two parts. Mix.

THIS is an excellent material as the basis of cataplasms. The oiliness of the oil-cake prevents it from drying and hardening at the edges.

Off. Prep.—Cataplasma simplex, *D.* Cataplasma carbonis ligni, *D.*

CHAP. XXXVII.—CONSERVES, ELECTUARIES AND CONFECTIONS*.

If confections have become hard by being long kept, they are to be moistened with water to restore their original consistence. *Lond.*

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* Electuaries, conserves, and confections, have never been well distinguished according to these denominations. A confection is an electuary, as well as an electuary is a confection, and both may also be called conserves.

To obtain more distinctive terms, Mr Chereau considers sugar as forming

Conserves are compositions of recent vegetable matters, and sugar, beaten together into a uniform mass.

This process is introduced for preserving certain simples, undried, in an agreeable form, with as little alteration as possible, in their native virtues. Vegetables may in this form be kept uninjured for a considerable time; for by carefully securing the mouth of the containing vessel, the alteration, as well as dissipation, of their active principles, is generally prevented; and the sugar preserves them from the corruption which juicy vegetables would otherwise undergo.

The sugar should be pounded and passed through a sieve, before it be mixed with the vegetable mass; for otherwise it cannot be properly incorporated. Rose buds, and some other vegetables, are prepared for mixing with the sugar, by grinding them in a small wooden mill.

There are, however, vegetables whose virtues are impaired by this treatment. Mucilaginous substances gradually become less glutinous; and astringents sensibly become softer upon the palate. Many of the fragrant flowers are of so tender and delicate a texture, as almost entirely to lose their peculiar qualities on being beaten or bruised.

In general, it is obvious, that in this form, on account of the large proportion of sugar, only substances of considerable activity can be taken with advantage as medicines; and, indeed, conserves are at present considered chiefly as vehicles for medicines of greater efficacy. They are very convenient for reducing into bolusses or pills the more ponderous powders, as submuriate of mercury, the oxides of iron, and other mineral preparations, which, with liquid or less consistent matters, as syrups, will not cohere.

The few conserves now retained have in general either an agreeable flavour to recommend them, or are capable of answering some useful purposes as medicines. Their common dose is the bulk of a nutmeg, or as much as can be taken up upon the point of a spoon. There is, in general, no great danger of exceeding in the dose.

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their base, and he has proposed *saccharolés* as a general term for all forms containing sugar as an ingredient. Among these preparations, there are some in which sugar, as a true excipient, predominates. These are, properly speaking, the *saccharolés*, which are again divided, according to their degree of consistency, into (*a*) syrups; (*b*) conserves, jellies, pastes; (*c*) troches, pastilles, tablets.

The second genus comprehends those in which the sugar is only a connecting medium. These are called *saccharidés*, and are also subdivided, according to their consistency, into (*a*) electuaries; (*b*) pills.

The *oleo-saccharolés*, (oleo-sacchara, elæo-sacchara of the ancients,) are combinations of volatile oil and sugar. This order is not subdivided. They serve only to augment the power of medicines, or to communicate to them an agreeable smell; but of themselves they are rarely medicinal.

Electuaries are composed chiefly of powders mixed up with syrups, &c. into such a consistence that the mass shall neither be too stiff to swallow, nor so thin as to allow the powders to separate, and that a dose may be easily taken up on the point of a tea-spoon.

In making extemporaneous electuaries, we may keep in view, that one part of the following substances absorb of syrup, to acquire the requisite consistency,—

Vegetable and other dry powders, three parts.

Gum resins, one part.

Resins, three-fourths of a part.

Mineral substances, as antimony and calomel, which do not absorb water, half a part.

Salts, half a part.

Alkalies and deliquescent salts, one-tenth of a part.

But those substances, after being mixed, often become in a short time so changed by mutual reaction, that the syrup added is absorbed, and a new quantity requires to be successively added for several times, to enable it to retain a proper degree of consistence. Thus, in associating in a confection supertartrate of potash and pure iron-filings, for one part of each, at first one part of syrup will be sufficient; on the following day another part must be added; and, at last, after three days, a third part will be required, in order to preserve the electuary of a proper consistence.

Where common syrups are employed, the compound is apt to candy and dry too soon; electuaries of peruvian bark, for instance, made up with syrup alone, will often in a day or two grow too dry for use. This is owing to the crystallization of the sugar. Deyeux, therefore, advises electuaries, confections, and conserves, to be made up with syrups, from which all the crystallizable parts have been separated. In hospital practice, the same object may be obtained much more easily by using molasses instead of syrups, and in private practice, by the substitution of a little conserve.

The quantity of an electuary directed at a time in extemporaneous prescription varies much, according to its constituent parts; but is rarely less than the size of a nutmeg, or more than two or three ounces.

Confectio amygdalarum. *Lond. Dub.*
Confection of Almonds.

Take of Sweet almonds, one ounce;
Gum arabic in powder, one drachm;
Refined sugar, half an ounce.

Having first blanched the almonds, by macerating them in water, and peeling them, beat the whole ingredients into a homogeneous mass.

This is a very convenient confection; for by triturating it with water, we immediately form an almond emulsion, which on many occasions is desirable, as it takes a considerable time to make it from the unmixed materials, and soon spoils after it is made.

CONFECTIO AURANTIORUM. *Lond.*
Confection of Orange-peel.

Take of Fresh orange-peel, grated off, one pound;
Refined sugar, three pounds.

Bruise the peel in a stone mortar with a wooden pestle; then, adding the sugar, beat them into a homogeneous mass.

CONSERVA CITRI AURANTII. *Ed.*
Conserve of Orange-peel.

Grate off the rind of Seville oranges, beat it into pulp, and while beating it, add gradually three times its weight of refined sugar.

CONFECTIO ROSÆ CANINÆ. *Lond.*
Confection of Hips.

Take of Pulp of hips, one pound;
Refined sugar, in powder, twenty ounces.

Expose the pulp to a gentle heat in a water-bath, then gradually add the sugar, and beat them into a homogeneous mass.

CONSERVA ROSÆ CANINÆ. *Ed.*
Conserve of Hips.

Beat ripe hips, carefully cleansed from the seeds and down, to a pulp; and, while beating it, gradually add three times its weight of double refined sugar.

CONFECTIO ROSÆ GALLICÆ. *Lond.*
Confection of Red Roses.

Take of Red rose buds, with the heels cut off, one pound;
Refined sugar, three pounds.

Beat the petals in a stone mortar; then add the sugar, and reduce the whole to a homogeneous mass.

CONSERVA ROSÆ. *Dub.*
Conserve of Red Roses.

Take of Red rose buds, with the heels cut away, one pound;

Refined sugar, three pounds.

Beat the petals in an earthen mortar; then add the sugar, and mix the whole intimately by contusion.

CONSERVA ROSÆ GALLICÆ. *Ed.*

Conserve of Red Roses.

Beat the petals of red rose buds to pulp; and add, during the beating, three times their weight of double refined sugar.

LA GRANGE says, that by infusing the red rose leaves in four times their weight of water, and squeezing them out of the infusion, they lose their bitterness, and are more easily reduced to a pulp, which he then mixes with a thick syrup, prepared by dissolving the sugar in the expressed liquor, and boiling it down to the consistence of an electuary.

Off. Prep.—Pilulæ hydrargyri, *D.*

It is scarcely necessary to make any particular remarks on these conserves. Their taste and virtues are compounded of those of sugar, and the substance combined with it. The hips are acidulous and refrigerant, the orange rind bitter and stomachic, and the red rose buds astringent.

ELECTUARIUM AROMATICUM. *Ed.*

Aromatic Electuary.

Take of Aromatic powder, one part;
Syrup of orange-peel, two parts.

Mix and beat them well together, so as to form an electuary.

CONFECTIO AROMATICA. *Lond. Dub.*

Aromatic Confection.

Take of Cinnamon bark,
Nutmeg, of each two ounces;
Cloves, one ounce;
Cardamom seeds, half an ounce;
Saffron, dried, two ounces;
Prepared oyster shells, *Lond.* (chalk, *Dub.*), sixteen ounces;
Refined sugar, in powder, two pounds;
Water, one pint.

Reduce the dry ingredients together to a very fine powder, then gradually add the water, and mix them until they be incorporated.

THESE compositions are sufficiently grateful, and moderately warm. They are given in the form of bolus, in doses of from five grains to a scruple, or upwards, as a cordial astringent, or as a vehicle for more active substances. Mr Phillips also very properly remarks, that in the London formula, and indeed in every instance, prepared chalk might be advantageously substituted for oyster shells, as it is hardly possible to reduce the latter to so fine a powder as the former.

ELECTUARIUM CASSIÆ FISTULÆ. *Ed.*
Electuary of Cassia.

Take of Pulp of cassia fistularis, four parts;
Pulp of tamarinds,
Manna, each, one part;
Syrup of pale roses, four parts.

Having bruised the manna in a mortar, dissolve it with a gentle heat in the syrup; then add the pulps, and evaporate with a regularly continued heat to a proper consistence.

ELECTUARIUM CASSIÆ. *Dub.*
Electuary of Cassia.

Take of The fresh extracted pulp of cassia, half a pound;
Manna, two ounces;
Pulp of tamarinds, one ounce;
Syrup of orange-peel, half a pound.

Dissolve the manna, bruised, with a moderate heat, in the syrup; then add the pulps; and evaporate slowly the mixture to a proper thickness.

CONFECTIO CASSIÆ. *Lond.*
Confection of Cassia.

Take of Fresh cassia pulp, half a pound;
Manna, two ounces;
Tamarind pulp, one ounce;
Syrup of roses, half a pint.

Bruise the manna; then dissolve it in the syrup, by the heat of a water-bath; lastly, mix in the pulps, and evaporate to a proper thickness.

THE electuary is scarcely used, as it is expensive and has very little power. It could be serviceable only as a vehicle for more active medicines.

ELECTUARIUM CATECHU COMPOSITUM. *Ed.*
Compound Electuary of Catechu.

Take of Extract of catechu, four ounces;
Kino, four ounces;
Cinnamon bark,
Nutmeg, each one ounce;
Opium, diffused in a sufficient quantity of Sherry wine, one drachm and a half;

Syrup of red roses, boiled to the consistence of honey, two pounds and a quarter.

Reduce the solids to powder; and having mixed them with the opium and syrup, make them into an electuary.

Dub.

Take of Catechu, four ounces;
Cinnamon, two ounces;
Kino, three ounces; powder these, then add,
Turkey opium, diffused in Spanish white wine, a drachm and a half;
Syrup of ginger, evaporated to the consistence of honey, two pounds and a quarter.

Mix them.

These electuaries are extremely useful astringent medicines, and are often given in doses of a tea-spoonful, frequently repeated, in cases of diarrhœa, &c. Ten scruples contain one grain of opium.

CONFECTIO SCAMMONEÆ. *Lond.* ELECTUARIUM SCAMMONII. *Dub.*

Confection of Scammony.

Take of Scammony, in powder, one ounce and a half;
Cloves, bruised,
Ginger, in powder, of each six drachms;
Oil of caraway, half a fluidrachm;
Syrup of roses, as much as is sufficient.

Reduce the dry substances together to a very fine powder; then add the syrup, and triturate them again together; lastly, add the oil of caraway, and mix the whole.

This electuary is a warm brisk purgative. A drachm contains ten grains of scammony.

ELECTUARIUM SENNÆ COMPOSITUM. *Ed.*
CONFECTIO SENNÆ. *Lond.*

Electuary or Confection of Senna.

Take of Senna leaves, eight ounces;
Coriander seeds, four ounces;
Liquorice root, bruised, three ounces;
Figs, one pound;
Pulp of prunes, one pound, *Ed.*; half a pound, *Lond.*
——— tamarinds, half a pound;
(——— cassia fistula, half a pound, *Lond.*)
Refined sugar, two pounds and a half;
Water, four pints.

Powder the senna leaves with the coriander seeds, and sift out ten ounces of the mixed powder; boil the remainder with the figs and liquorice in four pints of water to one half; express and strain the liquor, which is then to be evaporated to a pint and a half; dissolve the sugar in this so as to make a syrup; add this syrup by degrees to the pulps; and lastly, mix in the sifted powder.

ELECTUARIUM SENNÆ. *Dub.*
Electuary of Senna.

Take of Senna leaves, in very fine powder, four ounces;
Pulp of French prunes, one pound;
——— tamarinds, two ounces;
Molasses, a pint and a half;
Essential oil of caraway, two drachms.

Boil the pulps in the syrup to the thickness of honey; then add the powder, and, when the mixture cools, the oil; lastly, mix the whole intimately.

MR PHILLIPS, speaking of the London formula, says that it "is generally very badly prepared, containing neither senna nor cassia, and sold for one-third the price the genuine preparation costs." The Edinburgh formula is less liable to falsification, as it has omitted the cassia; but the formula of the Dublin College seems much more simple and judicious than the others. It would however be preferable to diffuse the pulps in the syrup boiled down to a sufficient consistency, than to boil them in it. In this respect the formula for the confection of senna of the other Colleges is preferable to that of Dublin.

Med. use.—It is a very convenient laxative, and has long been in common use among practitioners. Taken to the size of a nutmeg, or more, as occasion may require, it is an excellent laxative for loosening the belly in costive habits.

ELECTUARIUM OPIATUM; olim ELECTUARIUM THEBAICUM. *Ed.*
Opiate Electuary, formerly called *Thebaic Electuary.*

Take of Aromatic powder, six ounces;
Virginian snake-root, in fine powder, three ounces;
Opium, diffused in a sufficient quantity of Sherry wine, half an ounce;
Syrup of ginger, one pound.

Mix them, and form an electuary.

CONFECTIO OPII. *Lond. Dub.*
Confection of Opium.

Take of Hard opium, powdered, six drachms;
Long pepper, one ounce;
Ginger, two ounces;
Caraway seeds, three ounces;
(Gum tragacanth, in powder, two drachms, *Dub.*);
Syrup, one pint.

Mix the opium with the syrup heated; then add the other ingredients powdered, and mix.

THE action which these electuaries will produce on the living system is abundantly apparent from the nature of their ingredients. They are combinations of aromatics with opium; one grain of opium being contained in thirty-six of the London confection, and in forty-three of the Edinburgh electuary.

CONFECTIO PIPERIS NIGRÆ. *Lond. Dub.*

Confection of Black Pepper.

Take of Black pepper,
Elecampane root, of each one pound;
Fennel seeds, three pounds;
Honey,
Refined sugar, of each two pounds.

Triturate the dry ingredients together into a very fine powder; then add the honey, and beat the whole into an uniform mass.

WE are told by Dr Paris that this resembles Ward's Paste for fistula and piles, and that the dose is the size of a nutmeg, three times a-day. It is to be considered as a hot carminative.

CONFECTIO RUTÆ. *Lond. Dub.*

Confection of Rue.

Take of Rue leaves, dried,
Caraway seeds,
Laurel berries, of each an ounce and a half;
Sagapenum, half an ounce;
Black pepper, two drachms;
Clarified honey, sixteen ounces.

Triturate the dry substances together to a very fine powder; then adding the honey, mix the whole.

THIS was long supposed to be a powerful antihysteric. Its use is now confined to glysters.

CHAP. XXXVIII.—TROCHES.

TROCHES and lozenges are composed of powders made up with glutinous substances into little cakes, and afterwards dried. This form is principally made use of for the more commodious exhibition of certain medicines, by fitting them to dissolve slowly in the mouth, so as to pass by degrees into the stomach, or to act upon the pharynx and top of the trachea; and hence these preparations have generally a considerable proportion of sugar, or other materials grateful to the palate. Some powders have likewise been reduced into troches, with a view to their preservation. The lozenges of the confectioner are so superior in elegance to those of the apothecary, that they are almost universally preferred, and hence it probably is that the Dublin and London Colleges have entirely omitted them; yet some extensive apothecaries have a troche-maker in their establishment.

TROCHISCI CARBONATIS CALCIS. *Ed.*

Troches of Carbonate of Lime.

Take of Carbonate of lime, prepared, four ounces;
Gum arabic, one ounce;
Nutmeg, one drachm;
Refined sugar, six ounces.

Powder them together, and form them with water into a mass for making troches.

THESE are used against acidity of the stomach, especially when accompanied with diarrhœa.

TROCHISCI CARBONATIS MAGNESIÆ. *Ed.*

Troches of Carbonate of Magnesia.

Take of Carbonate of magnesia, six ounces;
Refined sugar, three ounces;
Nutmeg, one scruple.

Powder them, and make them into a mass for troches, with mucilage of tragacanth.

TROCHES of magnesia are much used for acidity of stomach.

TROCHISCI GLYCYRRHIZÆ GLABRÆ. *Ed.*

Troches of Liquorice.

Take of Extract of liquorice,

Gum arabic, each one part;
Refined sugar, two parts.
Boiling water, a sufficient quantity.

Dissolve and strain; then evaporate the solution over a gentle fire, till it be of a proper consistence for being formed into troches.

These troches are apt to be empyreumatic, and even when well prepared are found by many to be too sweet, and hence, common extract of liquorice, which is less cloying to the stomach than sugar, is preferred by some; and refined liquorice, which is made of extract of liquorice, with half of its weight of gum arabic, may altogether supersede these troches.

TROCHISCI GLYCYRRHIZÆ CUM OPIO. *Ed.*

Liquorice Troches with Opium.

Take of Opium, two drachms;
Tincture of Tolu, half an ounce;
Common syrup, eight ounces;
Extract of liquorice, softened with warm water,
Gum arabic, in powder, of each five ounces.

Triturate the opium well with the tincture, then add by degrees the syrup and extract; afterwards gradually mix in the powdered gum arabic. Lastly, dry them so as to form a mass, to be divided into troches, each weighing ten grains.

This is a troublesome process. It is not easy to make an uniform mixture of the opium with the tincture; and the softening of the liquorice in an undetermined quantity of warm water, and its subsequent incorporation, are equally inconvenient. They are more easily prepared, and the uniform diffusion of the opium is more certainly attained, by previously drying and reducing to powder the opium and liquorice, which are to be intimately mixed with the powdered gum arabic. This is to be beat into a mass first with the tincture, and then the syrup, and if necessary a little water gradually added. Refined extract of liquorice may be used; and it is easily powdered in the cold, after it has been laid for some days in a dry and rather warm place; but its quantity must be increased to 7.5 ounces, and that of the gum arabic reduced to 2.5.

Seven and a half of these troches contain about one grain of opium. These troches are medicines of approved efficacy in tickling coughs depending on irritation of the fauces, diminishing the irritability of the parts themselves.

TROCHISCI GUMMOSI. *Ed.*
Gum Troches.

Take of Gum arabic, four parts;
Starch, one part;
Refined sugar, twelve parts.

Powder them, and make them into a proper mass with rose-water, so as to form troches.

THIS is a very agreeable pectoral, and may be used at pleasure. It is calculated for allaying the tickling in the throat which provokes coughing.

TROCHISCI NITRATIS POTASSÆ. *Ed.*
Troches of Nitrate of Potass.

Take of Nitrate of potass, one part;
Double refined sugar, three parts.

Rub together to powder, and form them, with mucilage of gum tragacanth, into a mass, to be divided into troches.

THIS may be an agreeable form for the exhibition of nitre; but if the quantity taken be considerable, it is apt to occasion uneasiness in the stomach, which can only be prevented by large dilution with aqueous liquors.

CHAP. XXXIX.—PILLS.

THIS form is peculiarly adapted to those drugs which operate in a small dose, and whose nauseous and offensive taste or smell require them to be concealed from the palate.

Pills should have the consistence of a firm paste, a round form, and a weight not exceeding five grains. Essential oils may enter them in small quantity, deliquescent salts are improper. Efflorescent salts, such as carbonate of soda, should be previously exposed to the air until they fall to powder; deliquescent extracts should have some powder combined with them. The mass should be beaten until it become perfectly uniform and plastic. Powders may be made into pills with extract, balsams, soaps, mucilages, bread crumb, &c.

Gum-resins, and inspissated juices, are sometimes soft enough to be made into pills, without addition; where any moisture is requisite, spirit of wine is more proper than syrups or conserves, as it unites more readily with them, and does not sensibly increase their bulk. Light dry powders require syrups or mucilages; and the more ponderous, as the mercurial and other metallic preparations, require thick honey, conserve, or extracts.

Light powders require about half their weight of syrup, or about three-fourths their weight of honey, to reduce them into a due consistence for forming pills. Half a drachm of the mass will make five or six pills of a moderate size.

Gums and inspissated juices are to be first softened with the liquid prescribed; the powders are then to be added, and the whole beat thoroughly together, till they be perfectly mixed.

The masses for pills are best kept in bladders, which should be moistened now and then with some of the same kind of liquid that the mass was made up with, or with some proper aromatic oil.

When the mass is to be divided into pills, a given weight of it is rolled out into a cylinder of a given length, and of an equal thickness throughout, and is then divided into a given number of equal pieces, by means of a simple machine. These pieces are then rounded between the fingers, or by the machine *; and to prevent them from adhering, they are covered either with some powder, or gold or silver leaf. In this country we commonly use starch or powder of liquorice, or orris root. In Germany the powder of lycopodium is much employed, which gives to pills a smooth appearance, and defends them well from moisture. Liquorice is more apt to absorb. Gold or silver leaf is well adapted for preserving pills, for preventing them from uniting in a mass, and for pleasing the eye of the patient; and there is no inconvenience from it, unless the pills contain mercury, or sulphur, or their compounds.

PILULÆ ALOETICÆ. *Ed.*

Aloetic Pills.

Take of Aloes, in powder,
Soap, equal parts.

Beat them with simple syrup into a mass fit for making pills.

PILULÆ ALOES COMPOSITÆ. *Lond. Dub.*

Compound Pills of Aloes.

Take of Socotorine (Hepatic, *Dub.*) aloes, powdered, one ounce;
Extract of gentian, half an ounce;
Oil of caraway, forty minims;
Simple syrup, as much as is sufficient.

Beat them together into a homogeneous mass.

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* The machine used for rolling and forming pills is a *pilulier*, (pill machine); is commonly made of brass, but silver is preferable.

Although soap can scarcely be thought to facilitate the solution of the aloes in the stomach, as was supposed by Boerhaave, it is a very fit substance to give it the proper consistence for making pills.

The extract of gentian used by the London College is less proper; for triturated with aloes they re-act upon each other, and become too soft to form pills, so that the addition of any syrup to the mass is perfectly unnecessary; some powder is rather required to give it consistency.

Aloetic pills are much used as warm and stomachic laxatives; they are very well suited for the costiveness so often attendant on people of sedentary lives, and, upon the whole, are one of the most useful articles in the materia medica.

PILULÆ ALOES ET ASSAFŒTIDÆ. *Ed.*
Pills of Aloes and Assafœtida.

Take of Socotorine aloes, in powder,
Assafœtida,
Hard soap, equal parts.
Form them into a mass with mucilage of gum arabic.

These pills, in doses of about ten grains, twice a-day, produce the most salutary effects in cases of dyspepsia, attended with flatulence and costiveness.

PILULÆ ALOES ET MYRRHÆ. *Ed.*
Pills of Aloes and Myrrh.

Take of Socotorine aloes, four parts;
Myrrh, two parts;
Saffron, one part.
Beat them into a mass with simple syrup.

PILULÆ ALOES CUM MYRRHA. *Lond. Dub.*
Pills of Aloes with Myrrh.

Take of Socotorine (Hepatic, *Dub.*) aloes, two ounces;
Myrrh,
Saffron, of each one ounce;
Simple syrup, as much as is sufficient.
Powder the aloes and myrrh separately; and afterwards beat all the ingredients together into a homogeneous mass.

These pills have long continued in practice, with little alteration. Given to the quantity of half a drachm, or two scruples, they prove considerably cathartic, but they answer better in smaller doses as laxatives or alteratives.

PILULÆ ASSÆFŒTIDÆ COMPOSITÆ. *Ed.*
Compound Pills of Assafœtida.

Take of Assafœtida,
Galbanum,
Myrrh, of each eight parts;
Rectified oil of amber, one part.
Beat them into a mass with simple syrup.

PILULÆ GALBANI COMPOSITÆ. *Lond. Dub.*
Compound Pills of Galbanum.

Take of Galbanum, one ounce;
Myrrh,
Sagapenum, of each one ounce and a half;
Assafœtida, half an ounce;
Simple syrup, *Lond.* molasses, *Dub.* as much as is sufficient.
Beat them together into a homogeneous mass.

THESE pills are designed for antihysterics and emmenagogues, but they are apt to fall down after being made; half a scruple, a scruple, or more, may be taken every night, or oftener.

PILULÆ COLOCYNTHIDIS COMPOSITÆ. *Ed.*
Compound Pills of Colocynth.

Take of Socotorine aloes,
Scammony, of each eight parts;
Colocynth pulp, four parts;
Oil of cloves,
Sulphate of potass, of each one part.
Reduce the aloes and scammony with the sulphate into a powder; then mix in the colocynth beat into a very fine powder, and the oil: lastly, make it into a proper mass with mucilage of gum arabic.

Dub.

Take of Pith of colocynth, half an ounce;
Hepatic aloes,
Scammony, each one ounce;
Castile soap, two drachms;
Sulphate of potass,
Oil of cloves, one drachm;
Molasses, a sufficient quantity.
Powder the aloes and scammony with the sulphate of potass; then mix in the colocynth pith and oil of cloves; lastly, rub the whole into a mass, with the soap and molasses.

THIS is more powerful in its operation than the simpler aloetic pills.

PILULÆ GAMBOGIÆ COMPOSITÆ. *Ed.*

Compound Pills of Gamboge.

Take of Gamboge, in powder,
Socotorine aloes, in powder,
Compound powder of cinnamon, of each one drachm;
Soap, two drachms.

Mix the powders, then add the soap, and beat the whole into a homogeneous mass.

Lond. Dub.

Take of Gamboge in powder, a drachm;
Socotorine, (Hepatic, *Dub.*), aloes, in powder, a drachm and a half;
Ginger, half a drachm;
Soap, two drachms.

Mix the powders together, then add the soap, and beat the whole into a homogeneous mass, (with molasses, *Dub.*)

THIS is a very useful purgative pill, being considerably more active than aloes alone.

PILULÆ OPIATÆ; olim PILULÆ THEBAICÆ. *Ed.*

Opiate, formerly *Thebaic Pills.*

Take of Opium, one part;
Extract of liquorice, (soap?) seven parts;
Jamaica pepper, two parts.

Beat the opium and soap into a pulp, mix them: then add the pepper reduced to powder; and form the whole into a mass.

PILULÆ SAPONIS CUM OPIO. *Lond. Dub.*

Pills of Soap with Opium.

Take of Hard opium, (Turkey opium, *Dub.*) in powder, half an ounce;
Hard soap, two ounces.

Beat them into a homogeneous mass.

ALTHOUGH opium is naturally of that consistency that it can be readily formed into pills without any addition, yet it is convenient in practice to have an officinal form in which it is combined with some excipient, in a certain determinate proportion, to give it sufficient volume, or to admit more readily of its subdivision into smaller doses. Accordingly, every pharmacopœia contains some form of this kind; but it is greatly to be lamented that the Colleges should not have agreed upon the proportion of such an active drug as opium in pills, which are so similar, that they may be otherwise considered as substitutes for each other. The thebaic bills of Edinburgh are exactly one half of the strength of the others.

PILULÆ E STYRACE. *Dub.*

Storax Pills.

Take of Purified storax, three drachms;
Turkey opium,
Saffron, of each one drachm.
Beat them into an uniform mass.

WITH many people there exists so strong a prejudice against opium, that it is almost necessary to possess a form in which its presence is disguised by the taste and smell of some other substance, and is not indicated by the title. These views are attained by the storax pills of the Dublin College; and in other pharmacopœias we find equivalent compositions, as the *Pilulæ de Cynoglosso* of that of Paris.

PILULÆ RHEI COMPOSITÆ. *Ed.*

Compound Pills of Rhubarb.

Take of Rhubarb, in powder, one ounce;
Socotorine aloes, six drachms;
Myrrh, half an ounce;
Volatile oil of peppermint, half a drachm.
Make them into a mass, with syrup of orange peel.

THIS pill is intended for moderately warming and strengthening the stomach, and gently opening the belly. A scruple of the mass may be taken twice a-day.

PILULÆ SUBCARBONATIS SODÆ. *Ed.*

Pills of Subcarbonate of Soda.

Take of Dried subcarbonate of soda, four parts;
Hard soap, three parts.
Beat into a mass with simple syrup.

THIS is one of the most convenient forms of giving soda: It was introduced into use by Dr Beddoes; but the pills were very seldom well prepared. The salt should be previously quite deaquesced, and no water should be added, but the mass beat as stiff as possible.

PILULÆ SCILLÆ COMPOSITÆ. *Lond. Dub.*

Compound Pills of Squill.

Take of Fresh dried squills, powdered, one drachm;
Ginger, powdered,
Hard soap, of each three drachms;
Gum ammoniac, (in powder, *Lond.*), two drachms.

Mix the powders together, then beat them with the soap, (and gum ammoniac, *Dub.*), with the addition of as much syrup (molasses, *Dub.*) as will give them a proper consistence.

PILULÆ SCILLÆ CUM ZINGIBERE. *Dub.*
Squill Pills with Ginger.

Take of Powder of squills, one drachm;
Ginger, in powder, two drachms;
Essential oil of aniseed, ten drops.
Triturate together, and form into a mass with jelly of soap.

PILULÆ SCILLITICÆ. *Ed.*
Squill Pills.

Take of Dried root of squills, in fine powder, one scruple;
Gum ammoniac,
Lesser cardamom seeds, in powder,
Extract of liquorice, each one drachm.
Form them into a mass with simple syrup.

THIS is a commodious form for the exhibition of squills, whether for promoting expectoration, or with the other intentions to which that medicine is employed. As the virtue of the compound is derived chiefly from the squills, the other ingredients are often varied in extemporaneous prescription.

PILULÆ AMMONIARETI CUPRI. *Ed.*
Pills of Ammoniaret of Copper.

Take of Ammoniaret of copper, in fine powder, sixteen grains;
Bread crumb, four scruples;
Water of carbonate of ammonia, as much as may be sufficient.
Beat them into a mass, to be divided into thirty-two equal pills.

EACH of these pills weighs about three grains, and contains somewhat more than half a grain of the ammoniaret of copper. They seem to be the best form of exhibiting this medicine.

PILULÆ FERRI COMPOSITÆ. *Lond. Dub.*
Compound Pills of Iron.

Take of Myrrh, in powder, two drachms;
Subcarbonate of soda,
Sulphate of iron,
Sugar, (soft, *Dub.*) of each one drachm.

Powder the myrrh with the subcarbonate of soda; next having added the sulphate of iron, (and sugar, *Dub.*) rub them again; then beat the whole, (with molasses, *Dub.*) mixed together, into a homogeneous mass.

THIS is Griffith's mixture in a solid form, and may often be convenient.

PILULÆ SULPHATIS FERRI COMPOSITÆ. *Ed.*
Compound Pills of Sulphate of Iron.

Take of Sulphate of iron, in powder, one ounce;
Extract of chamomile, one ounce and a half;
Volatile oil of peppermint, one drachm.

Beat into a mass, with simple syrup.

THIS differs from the London pill, which contains the iron in the state of an oxide: in the formula of Edinburgh, the sulphate is exhibited in its saline form. Both are good chalybeates.

PILULÆ HYDRARGYRI. *Ed.*
Mercurial Pills.

Take of Purified quicksilver,
Conserve of red roses, of each one ounce;
Starch, two ounces;
Mucilage of gum arabic, a little.

Triturate the quicksilver with the conserve, in a glass mortar, till the globules completely diappear, adding, occasionally, a little mucilage of gum arabic; then add the starch, and beat the whole with a little water into a mass, which is to be immediately divided into four hundred and eighty equal pills.

Lond. Dub.

Take of Purified quicksilver, two drachms;
Confection of red roses, three drachms;
Liquorice root, powdered, (extract of liquorice in fine powder, *Dub.*) one drachm.

Rub the quicksilver with the confection until the globules disappear; then, adding the liquorice powder, mix them together into a homogeneous mass.

THE common mercurial pill is one of the best preparations of mercury, and may, in general, supersede most other forms of this medicine. In this preparation the mercury is minutely divided, and possibly converted into the black oxide. To effect its mechanical division, it must be triturated with some viscid substance. Soap, resin of guaiac, honey, extract of liquorice, and manna, have been, at different times, recommended; but all the colleges now concur in the use of conserve of roses. The mercury is most easily known to be completely extinguished, if no globules appear, on rubbing a very little of the mass with the point of the finger on a piece of paper. As soon as this is the case, it is necessary to mix with the mass a proportion of some dry powder, to give it a proper degree of consistency. For this purpose, powder of liquorice root has been commonly used; but it is apt to become mouldy, and to cause the pills to spoil. The Edinburgh College have, therefore, substituted for it starch, which is a very unalterable substance, and easily procured, at all times, in a state of purity. One grain of mercury is contained in four grains of the Edinburgh mass, and in three of the London and Dublin; but, in point of fact, the blue pill is now manufactured by machinery, and therefore uniform over the whole empire. The dose of these pills must be regulated by circumstances.

PILULÆ HYDRARGYRI SUBMURIATIS COMPOSITÆ. *Ed.*
Compound Pills of Submuriate of Mercury.

Take of Submuriate of quicksilver,
Precipitated sulphuret of antimony, of each one drachm;
Guaiac, in powder, two drachms.

Triturate the submuriate with the precipitated sulphuret of antimony, and then with the guaiac; and add as much mucilage of gum arabic as will give the mass a proper consistence.

Lond.

Take of Submuriate of mercury,
Precipitated sulphuret of antimony, of each two drachms;
Guaiac gum resin, in powder, half an ounce;
Rectified spirit, half a drachm.

Rub the submuriate of mercury with the precipitated sulphuret of antimony, and then with the guaiac, and add the spirit to give it a proper consistence.

PILULÆ CALOMELANOS COMPOSITÆ. *Dub.*
Compound Calomel Pills.

Take of Calomel,
Brown sulphuret of antimony, of each one drachm;
Guaiac resin, in powder, two drachms.

Rub them together until they be thoroughly mixed, then add as much molasses as will form them into a mass of the proper consistence.

These pills were recommended to the attention of the public, about forty years ago, by Dr Plummer, whose name they long bore. He represented them as a very useful alterative, and on his authority they were at one time much employed.

CHAP. XL.—CATAPLASMS *.

CATAPLASMA FERMENTI. *Lond.* CATAP. FERMENT. CEREVISIÆ. *Dub.*

Yeast Cataplasm.

Take of Flour, (wheat flour, *Dub.)* one pound;
Beer yeast, half a pint.
Mix and expose to a gentle heat, till the mass begin to swell.

The yeast excites fermentation in the flour, and converts the whole into a thin dough. This cataplasm is considered as a very efficacious application to putrid or putrescent ulcers or tumours.

CATAPLASMA SIMPLEX. *Dub.*

Simple Cataplasm.

Take of Powder for cataplasms, any quantity;
Boiling water, as much as may be sufficient to make it into a tepid cataplasm, whose surface is to be covered with olive oil.

This is an excellent emollient cataplasm. Its good effects depend entirely upon its being a means of keeping the part to which it is applied moist and warm, and therefore they are much promoted by its frequent renewal.

CATAPLASMA SINAPIS. *Lond.*

Mustard Cataplasm.

Take of Mustard seed,
Linseed, of each, in powder, half a pound;
Warm vinegar, as much as may be sufficient.
(Mix to the thickness of a cataplasm, *Lond.)*
Make into a cataplasm, which may be rendered more acrid by the addition of two ounces of sliced horseradish root.

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* Cataplasms are only thickened mucilages. The mucilaginous body here performs the principal part. The name of *mucostite* might be given to them.

Cataplasms of this kind are commonly known by the name of *Sinapisms*. They were formerly more complicated, containing garlic, squill, black soap, acetic acid and sea-salt. An excellent extemporaneous sinapism is made by spreading fresh-made mustard on a bit of linen.

Med. use.—They are employed only as stimulants; they often inflame and vesicate the part, but they are commonly removed in ten or fifteen minutes before they raise full blisters, and indeed the pain they excite cannot be longer borne. They are frequently applied to the soles of the feet, in the low state of acute diseases, for raising the pulse, and relieving the head. The chief advantage they have over blisters depends upon the quickness of their action.

CATAPLASMA CARBONIS LIGNI. *Dub.*

Cataplasm of Charcoal.

Take of Charcoal, recently heated to redness in the fire, and extinguished by pouring dry sand over it, and triturated into very fine powder, a sufficient quantity, and add it to a tepid simple cataplasm.

Recent charcoal absorbs gas of almost every kind very rapidly, and in considerable quantity. It has also the property of destroying the colour and smell of organic substances, by forming an union with the principles upon which they depend. These properties it however loses by exposure to the air, in consequence probably of its absorbing quality being saturated. Hence it must be recently ignited when applied for the purposes of absorbing colour, smell or gases. On this account it is here directed by the College to be made red hot immediately before it is to be made into a cataplasm. If, however, we were to allow it to cool in the open air, a great part of it would be dissipated in the form of carbonic acid gas. To prevent this we are directed to extinguish it by covering it up with clean and dry sand until it cool. It is now to be quickly cleaned from any adhering sand, reduced to a fine powder, and stirred into a tepid simple cataplasm, until it acquire a proper thickness. The cataplasm should be made of a thinner consistence than when it is to be used by itself; and it is a defect in the College directions, that the due proportions of charcoal and cataplasm are not indicated.

Med. use.—It possesses in a remarkable degree the property of destroying the odour of gangrenous and fœtid ulcers, by absorbing the gases and vapours they exhale. It also improves the character of the sore. It should be renewed several times a-day.

CATAPLASMA DAUCI. *Dub.*

Carrot Poultice.

Take of The root of cultivated carrot, any quantity.

Boil the root in water until it be rendered so soft that it make a cataplasm.

THE making of cataplasms of this kind is very easy. Any of the tender roots, as carrot, turnip or potatoe, is to be well washed, and to be pared if necessary. They are then to be boiled until they become quite tender, to be quickly beaten into a pulp, and squeezed through a coarse hair-sieve or culinder, in the same manner as mashed potatoes are made in the kitchen. The addition of a little milk is an advantage, especially if it shall be necessary to heat them again before application.

Med. use.—These are generally emollient cataplasms, and that of the carrot is supposed to possess considerable power in correcting offensive and malignant ulcers.

CATAPLASMA CONII. *Dub.*

Hemlock Poultice.

Take of Dry hemlock leaves, one ounce;
Water, a pint and a half.

Boil down to one pint, and to the filtered decoction add as much powdered hemlock leaves as may be required to make a poultice.

THE directions here are deficient in not pointing out the quantity of the powder of hemlock leaves sufficient to give a pint of the decoction the thickness of a cataplasm. The unpractised apothecary should be instructed how much he is to provide for that purpose.

Med. use.—This is not an uncommon application in open cancer and painful sores. It acts as an anodyne in allaying pain. But we must keep in mind that it may produce narcotic effects by absorption.

CATAPLASMA ALUMINIS. *Dub.*

Alum Cataplasm.

Take the White of two eggs;
Of alum, one drachm.

Shake together, so as to form a coagulum.

THE directions here are also deficient, as they do not tell whether the alum is to be used in powder or in mass; nor indicate how the white of egg is to be treated, for the preparation to succeed. The white of egg, as separated from the yolk, is still contained in membranes which render it glairy. In order to render it liquid, it must first be beat with the prongs of a fork, or the edge of a knife, and then briskly shaked with a lump of alum. In a short time the white of egg is coagulated, and the undissolved portion of the alum is then to be taken out. The alum curd, thus formed, consists of coagulated albumen, holding as an interstitial fluid a solution of alum. It is therefore a means of applying alum in a very soft substance.

Med. use.—It is frequently used as an astringent application in cases of purulent and ichorous ophthalmia, for which purpose it is commonly inclosed between two folds of very fine linen or cambric. It is also a good application to excoriated surfaces, and to external inflammations, as chilblains, and bruised surfaces in typhoid fevers.

CHAP. XLI.—LINIMENTS, OINTMENTS, CERATES AND PLASTERS*.

THESE are all combinations of fixed oil, or animal fat, with other substances, and differ from each other only in consistence. Deyeux has, indeed, lately defined plasters to be com-

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[*] According to M. Chereau, the Dispensatory furnishes an example of the confusion which reigns in the vulgar nomenclature of these substances.

Liniments are often combinations of oil and lime, of oil and ammonia, and ought to be classed with the soaps. Some contain only oil and camphor, and considering, as is done in the French Pharmacopœia, that they are all extemporaneous formulæ, they ought, according to the nomenclature of M. Chereau, to have the name of *oleolites*. Again, a little more or less of firmness is all that distinguishes ointments from cerates, and cerates from plasters. But this degree of firmness is unchangeable, and modified by the influence of the air, temperature, and time. Hence it is an unscientific classification.

If we reflect upon the nature of the medicinal compounds, which pharmacy furnishes for external use in medicine, it will be evident that the only method of classifying them which presents a certain foundation, is according to their excipients. From this results two great natural divisions; 1*st*, the oily compounds; 2*d*, the fatty compounds.

Oily Compounds.—It is to be remarked that oil is often the only greasy body in their composition, as in medicinal oils, and the resulting medicine is in a fluid state. Sometimes, on the contrary, they hold wax in solution, which gives to the compound a semiliquid consistency, as in cerate. Lastly, besides wax they may contain resins in solution, as in certain soft ointments. Thus the oily compounds present three genera: 1*st*, oils, or *oléolés;* 2*d*, oils and wax, *oleo-céroles;* 3*d*, oils with wax and resin, *oleo-céreolés resineux*.

Fatty Compounds.—These, so long as they contain nothing but resins and wax, impregnated only with vegetable aroma or colouring principles, or when they are united with metallic substances, only by incorporation or division, do not suffer any very notable change in their composition; but this is not the case when the excipient is united with metallic oxides by combination; there then result very peculiar compounds; and this combination is so intimate, and so changes their nature, that they were for a long time considered as metallic soaps, and that binations of oil with metallic oxides; but as this would comprehend many of our present ointments, and exclude many of our plasters, we shall adhere to the old meaning of the terms.

Liniments are the thinnest of these compositions, being only a little thicker than oil.

Ointments have generally a degree of consistence like that of butter.

Cerates are firmer, and contain a larger proportion of wax.

Plasters are the most solid, and derive their firmness, either from a large proportion of wax, rosin, &c. or from the presence of some metallic oxide, such as that of lead.

Plasters should have such a consistence as not to adhere to the fingers when cold, but become soft and plastic when gently heated. The heat of the body should render them tenacious enough to adhere to the skin, and to the substance on which they are spread. When prepared they are usually formed into rolls, and inclosed in paper. Plasters of a small size are often spread on leather, sometimes on strong paper, or on tinfoil, by means of a spatula gently heated, or the thumb. The leather is cut of the shape wanted, but somewhat larger; and the margin all around, about ¼ inch in breadth, is left uncovered, for its more easy removal when necessary. Linen is also used, especially for the less active plasters which are used as dressings, and often renewed. It is generally cut into long slips, of various breadths, from one to six inches. These may either be dipt into the melted plaster, and passed through two pieces of straight smooth wood, held firmly together, so as to remove any excess of plaster; or, what is more elegant, they are spread on one side only, by stretching the linen, and applying the plaster, which has been melted and allowed to become almost cold, evenly, by means of a spatula gently heated, or, more accurately, by passing the linen on which the plaster has been laid, through a machine formed of a spatula fixed by screws, at a proper distance from a plate of polished steel.

The Dublin College prefixes the following general direction:

Calamine employed in making ointments is prepared in the same manner as chalk.

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since the publication of M. Chevreul, they have been classed among the salts with metallic oxides for their base. M. Chereau has proposed the generic term *Stearotes* for plasters formed by combination.

Thus these compounds are divided naturally into two genera: 1*st*, Fatty compounds, *stéarolés*; 2*d*, Fatty compounds combined with oxides, *stearates*. The *stearolés* include a great number of the compounds of which fat is the excipient, but the denomination of *Stéarolés solides* is given to plasters by mixture.

In making ointments and plasters, the wax, resins, and fats, are to be melted with a moderate heat, then removed from the fire, and constantly stirred, until they cool, adding, at the same time, the dry ingredients, if there be any, in very fine powder.

SEVUM PRÆPARATUM. *Lond.*
Prepared Suet.

Cut the suet into pieces, melt it over a slow fire, and express it through linen.

ADEPS PRÆPARATA. *Lond.*
Prepared Hogs Lard.

Cut the lard into pieces, melt it over a slow fire, and express it through linen.

ADEPS SUILLUS PRÆPARATUS. *Dub.*
Prepared Hogs Lard.

Melt fresh lard, cut in pieces, with a moderate heat, and strain with expression through flannel.

Lard, which is purified by those who sell it, and which is preserved with salt, is to be melted with twice its weight of boiling water, and the mixture well agitated. Set it then aside until it cool, and separate the fat.

ADEPS OVILLUS PRÆPARATUS. *Dub.*
Prepared Suet,

Is prepared in the same manner.

THESE fatty substances differ very much in consistency. The suet selected is the kidney fat of the sheep, and is the most solid and least fusible of the common animal fats. The lard is much softer and more fusible; and for medical purposes, the subcutaneous fat covering the ribs is preferred by the continental pharmaceutists, as being of firmer and denser consistency. In this country it is commonly converted into bacon, and the lard used is the fat of the omentum and intestines. Before proceeding to melt these fats, care must be taken to separate from it the pellicles, fibres, and foreign matters, which in the boiling might communicate to it a bad smell. They must also be washed in repeated quantities of water, until it get no colour from them. When sufficiently heated, they become perfectly limpid and transparent; but as they contain a little of the water in which they have been washed, they must be kept in fusion until this be dissipated, but no longer. This is known by throwing a few drops into the fire. If they do not crackle, it is a sign that all the water is evaporated, and that the fats are ready for straining, which should be done through a linen cloth without expression. The fluid fat should be poured into the vessels, or bladders, in which it is to be preserved.

The Edinburgh College have transferred the prepared fats into their list of the materia medica; as the apothecary, in general, finds it more convenient to purchase them; for it is thought that the process requires to be very cautiously conducted, to prevent the fat from burning or turning black.

In France the apothecary commonly prepares his own lard, and does not consider it troublesome. He has also the advantage of being able to reckon on its purity; and he has no fear of its being burnt or altered, faults which arise only from improper preparation. He obtains from the first melting a white lard free from water, without bad smell, on whose surface there is often observed, when it has cooled, a kind of symmetric figure, representing rays spreading from a centre, and diverging to their circumference. A more coloured lard, which is obtained by a repetition of the process, is employed in the laboratory for ointments.

Perfumers, after having cut the fat into pieces, beat it in a mortar, and, having washed it in several waters until it is very clean, melt it, and add 64 grammes of alum and a handful of salt to 25 or 30 kilogrammes of fat. In this state it is heated till it boil a little, and is filtered through a sieve of iron wire. This mass is again melted in a water-bath, and mixed with three litres of rose water. The mixture is allowed to settle, and drawn off clear. This is what is called a pomatum body, *(corps de pommade,)* which keeps well, and is made more or less firm according to the season.

Perfumers' lard, from its saline impregnations, is not fit for the use of the apothecary, until after it has been well washed.

Off. Prep. of prepared lard.—Ung. acidi nitrici, *D.* U. acidi sulphurici, *D.* U. ceræ albæ, *D.* U. ceræ flavæ, *D.* U. cetacei, *D.* U. conii, *D.* U. elemi, *D.* U. gallarum, *D.* U. hydrargyri, *D. L.* U. hydr. mitius, *D. L.* U. hydr. oxidi nitrici, *D. L.* U. hydr. submur. ammon. *D. L.* U. hydr. nitratis, *D. L.* U. iodinii, *D.* U. picis liquidi, *L.* U. piperis nigri, *D.* U. potassæ hydriodatæ, *D.* U. resinæ albæ, *D.* U. sabinæ, *D. L.* U. sambuci, *D. L.* U. scrophulariæ, *D.* U. sulphuris, *D. L.* U. sulph. comp. *L.* U. tartari emetici, *D.* U. veratri, *D. L.* U. zinci, *L.* Emplastrum cantharidis, *D. L.*

Off. Prep. of prepared suet.—Unguent. elemi, *L.* U. picis liquidæ, *D.* U. sambuci, *D.* U. scrophulariæ, *D.* Emplastr. cantharidis, *D.* Empl. ceræ, *L.*

LINIMENTUM SIMPLEX. *Ed.*
Simple Liniment.

Take of Olive oil, four parts;
White wax, one part.

Melt the wax in the oil with a gentle heat, then stir the mixture well until it become stiff on cooling.

Off. Prep. of simple liniment.—Ung. oxidi zinci imp. *E.* Ung. oxidi zinci, *E.*

UNGUENTUM SIMPLEX. *Ed.*
Simple Ointment.

Take of Olive oil, five parts;
White wax, two parts;

Melt the wax in the oil with a gentle heat, then stir the mixture well until it become stiff on cooling.

THESE two preparations differ only in the proportion of their ingredients and consequent consistence; both may be used for softening the skin and healing chaps.

Off. Prep. of simple ointment.—Ung. carbonatis plumbi, *E.* Ung. acetatis plumbi, *E.*

CERATUM SIMPLEX. *Lond.*
Simple Cerate.

Take of Olive oil, four fluidounces;
Yellow wax, four ounces.

Add the oil to the melted wax, and mix.

THIS is the common cerate, of which so much use is made in dressings. Parmentier has recommended for cerates the use of yellow wax, as being more natural. Wax certainly loses its smell by bleaching, and its balsamic qualities must be impaired.

In the French Codex the *Ceratum simplex* is made with one of white wax to three of almond oil. If the proportion of wax be increased, as 9 to 16 of oil, and the cerate be coloured with alkanet, and flavoured with some fragrant oil, it forms lip-salve, or *Pomatum ad labia demulcenda.* Their *Oleo-ceratum aquâ subactum* or *Ceratum album,* vulgarly *Ceratum Galeni,* is made of one part of wax, four of almond oil, and three of rose-water beat together, and is the cold cream of our perfumers.

UNGUENTUM CETACEI. *Lond.*
Ointment of Spermaceti.

Take of Spermaceti, six drachms;
White wax, two drachms;
Olive oil, three fluidounces.

Melt them together over a slow fire, and stir them constantly until they be cold.

Dub.

Take of White wax, half a pound;
Spermaceti, one pound;
Prepared hogs lard, three pounds.

Melt by heat, and while concreting stir with a wooden spathula.

This had formerly the name of *Linimentum album;* it is also a very mild application.

CERATUM SIMPLEX. *Ed.*
Simple Cerate.

Take of Olive oil, six parts;
White wax, three parts;
Spermaceti, one part.

Melt the wax and spermaceti with the oil in a gentle heat, then stir the mixture well, until it become stiff on cooling.

CERATUM CETACEI. *Lond.*
Cerate of Spermaceti.

Take of Spermaceti, half an ounce;
White wax, two ounces;
Olive oil, four fluidounces.

Add the oil to the wax and spermaceti, melted together, and stir until the cerate be cold.

This had formerly the name of *Ceratum album;* and it differs from the spermaceti ointment, only in being more consistent.

Off. Prep. of simple cerate.—Ung. carbon. zinci impuri, *E.* Cerat. cantharidis, *L.*

UNGUENTUM CERÆ FLAVÆ. *Dub.*
Ointment of Yellow Wax.

Take of Purified yellow wax, a pound;
Prepared hogs lard, four pounds.

Make into an ointment.

Off. Prep. of ointment of yellow wax.—Ung. calaminæ, *D.*

UNGUENTUM CERÆ ALBÆ. *Dub.*
Ointment of White Wax.

Take of White wax, one pound;
Prepared lard, four pounds.
Make into an ointment.

Off. Prep. of ointment of white wax.—Ung. tutiæ, *D.* Ung. oxidi zinci, *D.* Ung. acetatis plumbi, *D.* Ung. plumbi carbon. *D.*

THERE is great confusion among the simple liniments, ointments, and cerates, in regard to their composition and consistency. Some are made of white wax, others of yellow; each of these is again combined in various proportions with oil, or lard, and some have spermaceti added to them. The following table gives a synoptical view of those officinal in these kingdoms:—

	Olive oil.	Lard.	White wax.	Yellow wax.	Spermaceti.
Linim. simp. *Ed.*	4	—	1	—	—
Unguent. simp. *Ed.*	5	—	2	—	—
Ceratum simplex, *Lond.*	1	—	—	1	—
——— *Ed.*	6	—	3	—	1
Ceratum cetacei, *Lond.*	8	—	4	—	1
Unguent. cetacei, *Lond.*	12	—	1	—	3
——— *Dub.*	6	—	1	—	2
Ungt. ceræ albæ, *Dub.*	—	4	1	—	—
Ungt. ceræ flavæ, *Dub.*	—	4	—	1	—

CERATUM RESINÆ. *Lond.*
Resinous Cerate.

Take of Yellow resin,
Yellow wax, of each one pound;
Olive oil, one pint.
Melt the resin and wax together with a slow fire; then add the oil, and strain the cerate, while still hot, through linen.

UNGUENTUM RESINÆ ALBÆ. *Dub.*
Ointment of White Resin.

Take of Prepared hogs lard, four pounds;
White resin, two pounds;
Yellow wax, one pound.
Make into an ointment, which is to be strained, while hot, through a sieve.

UNGUENTUM RESINOSUM. *Ed.*
Resinous Ointment.

Take of Hogs lard, eight parts;
Pine resin, five parts;
Yellow wax, two parts.
Melt the whole together, and stir the mixture well, until it become stiff on cooling.

These, which are varieties of the basilicon ointment, are commonly employed in dressings for digesting, cleansing, and incarnating wounds and ulcers.

Off. Prep. of resinous ointment.—Ung. subacetatis cupri, *E. D.* Ung. cantharidis, *L. E. D.* Linim. terebinthinæ, *L. D.*

LINIMENTUM TEREBINTHINAE. *Lond. Dub.*
Turpentine Liniment.

Take of Resinous cerate, one pound;
Oil of turpentine, half a pint.

Add the oil of turpentine to the cerate melted, and mix, (gradually, *Dub.*)

Much used for rubbing parts affected with rheumatic pains, and on sprained joints. Lint dipped in this liniment, melted, is applied as hot as it can be borne, as dressing to sphacelating and other sores which require to be stimulated. It is also an excellent application to burns.

UNGUENTUM ELEMI. *Dub.*
Ointment of Elemi.

Take of Resin of elemi, one pound;
White wax, half a pound;
Prepared hogs lard, four pounds.

Make into an ointment, and strain it through a sieve while hot.

UNGUENTUM ELEMI COMPOSITUM. *Lond.*
Compound Ointment of Elemi.

Take of Elemi, one pound;
Common turpentine, ten ounces;
Suet, prepared, two pounds;
Olive oil, two fluidounces.

Melt the elemi with the suet; and having removed it from the fire, mix with it immediately the turpentine and oil; after which strain the mixture through linen.

This ointment, formerly known by the name of *Linimentum Arcæi*, had great reputation for digesting, cleansing, and incarnating ulcers; and, as Mr Wilson states in his excellent Pharmacopœia Chirurgica, may be usefully employed for promoting a discharge from issues and setons.

UNGUENTUM PICIS LIQUIDÆ. *Lond.*
Tar Ointment.

Take of Tar,
Prepared suet, of each one pound.

Melt them together, and express through linen.

Dub.

Take of Tar,
Mutton suet prepared, of each half a pound.
Melt them together, and strain through a sieve.

Ed.

Take of Tar, five parts;
Yellow wax, two parts.
Melt the wax with a gentle heat, then add the pitch, and strain the mixture constantly until it stiffens on cooling.

These are stimulating compositions, whose virtues depend upon the tar, which contains empyreumatic resin, and pyrolignic acid. They are chiefly used in some forms of porrigo.

UNGUENTUM PICIS NIGRI. *Lond.*
Ointment of Pitch.

Take of Pitch,
Yellow wax,
Yellow resin, of each nine ounces;
Olive oil, a pint.
Melt together, and express through linen.

This is a very stimulant ointment, from the empyreumatic resin.

UNGUENTUM CONII. *Dub.*
Ointment of Hemlock.

Take of Fresh hemlock leaves,
Prepared hogs lard, of each two pounds.
Boil the hemlock leaves in the lard until they become crisp, then express through linen.

The chlorophylle and narcotic principle of fresh narcotic vegetables is soluble, by the assistance of heat, in oily solvents; and in the foreign pharmacopœias there are many officinal preparations of this kind, called *Olea infusa.* In the Codex of Paris such oils are prepared from hemlock, henbane, stramonium, tobacco, *solanum nigrum* and rue. These preparations retain the consistency of olive oil, being limpid in summer and partially frozen in winter. They are used as external anodyne applications, and constitute a useful class of remedies, as their anodyne property is not counteracted by any mechanical irritation. The formula now introduced by the Dublin only differs in the employment of lard instead of oil, and will be found an useful application to irritable piles, in cancer of the womb, rectum, or breast, and in painful scirrhous glandular swellings. Mr Wilson praises it against that painful species of ulcer which attacks the junction of the toes and fingers with the foot and hand.

UNGUENTUM GALLARUM. *Dub.*
Ointment of Nutgalls.

Take of Nutgalls, in very fine powder, one ounce;
Prepared hogs lard, eight ounces.
Mix into an ointment.

THIS is a powerful astringent ointment, and is advantageously applied in cases of hæmorrhoids and *prolapsus ani.* It has, however, the imperfection, that the active substance is not dissolved in the excipient, but mixed with it as a powder, and this is severely felt by those who suffer under irritable piles.

This ointment has opium often added to it to render it more anodyne; and of this nature is an ointment officinal in our hospital, under the title of *Ungt. gallæ opiatum,* composed of ointment of acetate of lead one ounce, with powder of gallnuts two drachms, and powder of opium one drachm.

UNGUENTUM PIPERIS NIGRI. *Dub.*
Ointment of Black Pepper.

Take of Prepared lard, one pound;
Black pepper, in powder, four ounces.
Make into an ointment.

THIS should be stimulating and irritating. I do not know the cases to which it is adapted.

UNGUENTUM SAMBUCI. *Lond.*
Elder Ointment.

Take of Elder flowers,
Prepared lard, of each two pounds.
Boil the flowers in the lard till they become crisp; then express through linen.

Dub.

Take of Fresh elder flowers, three pounds;
Prepared hogs lard, four pounds;
Prepared mutton suet, two pounds.
Boil the flowers in the lard until they become crisp; then strain with expression; lastly, add the suet, and melt them together.

THIS is merely a perfumed pomatum.

UNGUENTUM SABINÆ. *Dub.*
Savine Ointment.

Take of Fresh savine leaves, separated from the stalks and bruised, half a pound;
Prepared hogs lard, two pounds;
Yellow wax, half a pound.

Boil the leaves in the lard until they become crip; then filter with expression; lastly, add the wax, and melt them together.

CERATUM JUNIPERI SABINÆ. *Ed.* CERATUM SABINÆ. *Lond.*
Cerate of Savine.

Take of Fresh savine leaves, bruised, one pound, (two parts, *Ed.)*
Yellow wax, half a pound, (one part, *Ed.)*
Prepared hogs lard, two pounds, (four parts, *Ed.)*

Boil the savine leaves with the lard and wax melted together, and express through linen.

WHEN properly prepared, this is another example of the impregnation of an ointment with the virtues of vegetable substances. The fresh leaves are to be boiled in the melted cerate until they become crisp and friable, which is a proof that all their water is exhaled, and their resin is dissolved. The ointment has now acquired a fine green colour, and is uniform and transparent, without any tendency to separate. In this state it is an excellent issue ointment, preferable to those of cantharides, especially in being less irritating, and having no tendency to excite strangury.

When no fresh leaves are to be had, or from indolence, the powder stirred into melted cerate is substituted for the boiled ointment, it then becomes intolerably acrid, and almost caustic; and the practice should be discontinued. This improper ointment is easily known by being opaque and gritty, not smooth, and somewhat translucent.

UNGUENTUM SCROPHULARIÆ. *Dub.*
Ointment of

Take of Fresh leaves of scrophularia,
Prepared hogs lard, of each two pounds;
Prepared mutton suet, one pound.

Boil the leaves in the fats until they become crisp, and then filter by expression.

THIS is another boiled ointment with which the Dublin College has increased the number of our officinal preparations. Without presuming to deny its utility, I have to confess my ignorance of its virtues.

UNGUENTUM VERATRI. *Lond.*
Ointment of White Hellebore.

Take of White hellebore root, in powder, two ounces;
Prepared hogs lard, eight ounces;
Oil of lemon, twenty minims.
Mix.

Dub.

Take of White hellebore root, in powder, three ounces;
Prepared hogs lard, one pound.
Make into an ointment.

THIS is recommended in scabies, and other itchy cutaneous affections. Its virtues depend upon the narcotic alkali *veratria.*

UNGUENTUM INFUSI CANTHARIDIS VESICATORIÆ. *Ed.*
Ointment of Infusion of Cantharides.

Take of Cantharides,
White resin,
Yellow wax, each one part;
Hogs lard,
Venice turpentine, each two parts;
Boiling water, four parts.

Macerate the cantharides in the water for a night; then strongly press out and strain the liquor, and boil it with the lard till the water be consumed; then add the resin and wax; and, when these are melted, take the ointment off the fire, and add the turpentine.

UNGUENTUM CANTHARIDIS. *Lond. Dub.*
Ointment of Spanish Flies.

Take of Spanish flies, in very fine powder, two ounces;
Distilled water, eight fluidounces;
Cerate of resin, *Lond.* (ointment of white resin, *Dub.*) eight ounces.

Boil the water with the flies to one-half, and filter; mix the cerate with the filtered liquor, and then evaporate to a proper consistence.

THERE is considerable difficulty, I understand, in preparing this ointment; for, when the water of the infusion of cantharides is boiled away, the matter which was dissolved by it has no tendency to unite with the ointment, but separates from it, and falls to the bottom. Constant stirring is therefore necessary, until the ointment becomes so thick, that no separation can take place. When properly made, it is a good issue ointment, sufficiently stimulating, but not so irritating as when the cantharides in powder are mixed with the ointment. A very good stimulating liniment may be composed by melting one part of this with half a part of camphor in powder, and three parts of turpentine.

UNGUENTUM PULVERIS CANTHARIDIS VESICATORIÆ. *Ed.*
Ointment of the Powder of Cantharides.

Take of Resinous ointment, seven parts;
Cantharides, in very fine powder, one part.

Sprinkle the powder into the melted ointment, and stir the mixture constantly, until it become stiff, on cooling.

CERATUM CANTHARIDIS. *Lond.*
Cerate of Cantharides.

Take of Spanish flies, in very fine powder, one drachm;
Cerate of spermaceti, six drachms.

Add the flies to the cerate, softened over the fire, and mix.

THIS ointment is employed in the dressing for blisters intended to be converted into issues, or to be kept running for a considerable time, which in many chronic and some acute cases is of great service. Particular care should be taken that the cantharides be reduced into a very subtile powder, and that the mixture be made as equal and uniform as possible.

UNGUENTUM TARTARI EMETICI. *Dub.*
Ointment of Tartar Emetic.

Take of Tartrate of potass and antimony, one drachm;
Prepared hogs lard, one ounce;

Triturate the salt into a very fine powder; then mix it with the lard.

THIS ointment, for whose introduction we are indebted to Professor Authenrieth of Tubingen, has lately come into very general use, and deservedly, for it is one of the best of our counter-stimulants. In preparing it, great care must be taken in reducing the tartar-emetic to very fine powder, otherwise it acts more slowly. The proportion of the antimonial salt, although enough for common use, is scarcely sufficient in cases when the skin is inirritable; and Prof. Authenrieth ascertained that lard is capable of absorbing, and forming into an ointment, one-third of its weight of powder. This proportion I often use. Its effects are, in the course of a day or two to excite a crop of broad flat pustules, very much resembling irritated cow-pox vesicles; and attention must be paid not to carry the irritation too far, as they become exceedingly painful, and even malignant.

Med. use.—It was originally introduced as a counter-stimulant in hooping cough. Dr Jenner afterwards extended its use to other nervous diseases, and it is now generally employed in obstinate internal inflammations, as in pulmonary disorders, hydrocephalus, and inflammation of the liver. It is rubbed upon the spine in epilepsy, chorea, and other affections of the muscular and nervous systems.

UNGUENTUM SUBACETATIS CUPRI. *Ed.*

Ointment of Subacetate of Copper.

Take of Resinous ointment, fifteen parts;
Subacetate of copper, in very fine powder, one part.

Sprinkle the subacetate upon the ointment melted, and stir constantly until the mixture get stiff, on cooling.

Dub.

Take of Prepared subacetate of copper, half an ounce;
Olive oil, one ounce;
Ointment of white resin, one pound.

Triturate the subacetate of copper with the oil, then add this to the ointment of white resin melted, and mix.

THIS ointment is used for cleansing sores, and keeping down fungous flesh. It is also frequently used with advantage in cases of ophthalmia, depending on scrofula, where the palpebræ are principally affected; but when it is to be thus applied, it is, in general, requisite that it should be somewhat weakened by the addition of a proportion of simple ointment or hogs lard.

Mr Wilson says it is the only remedy which is capable of curing the obstinate and malignant variety of ring-worm, said to have been imported from the East Indies. The scalp is to be kept close shaved, washed every night with warm water and soap, and afterwards with bran and water, then rubbed dry, and the ointment applied either with the finger, or lightly spread on lint; and during the whole treatment, which is sometimes tedious, the oil skin cap is to be worn. If the ointment excite pustules or erysipelatous inflammation, its use must be suspended till these be removed.

UNGUENTUM HYDRARGYRI. *Ed.*

Ointment of Quicksilver.

Take of Purified quicksilver,
Mutton suet, each one part;
Hogs lard, three parts.

Rub the mercury diligently in a mortar, with a little of the hogs lard, until the globules entirely disappear; then add the rest of the fats.

This ointment may also be made with double or triple the quantity of quicksilver.

Dub.

Take of Purified quicksilver,
Prepared hogs lard, equal weights.

Triturate them together in a marble or iron mortar, until the globules of quicksilver disappear.

UNGUENTUM HYDRARGYRI MITIUS. *Dub.*

Milder Ointment of Quicksilver,

Is made with twice the quantity of lard.

UNGUENTUM HYDRARGYRI FORTIUS. *Lond.*

Stronger Mercurial Ointment.

Take of Purified quicksilver, two pounds;
Prepared hogs lard, twenty-three ounces;
Prepared mutton suet, one ounce.

First triturate the quicksilver with the suet and a little of the hogs lard, until the globules be extinguished; then add the rest of the lard, and mix.

IT is requisite that the ointments in which the mercury is extinguished by trituration, should be prepared with very great care; for upon the degree of triture which has been employed, the activity of the mercury very much depends. The addition of the mutton-suet, now adopted by London and Edinburgh, is an advantage to the ointment, as it prevents it from running into the state of oil, which the hogs lard alone, in warm weather, or in a warm chamber, is sometimes apt to do, and which is followed by a separation of the quicksilver. We are even inclined to think, that the proportion of suet, directed by the London College, is too small for this purpose, and, indeed, seems to be principally intended for the more effectual triture of the mercury; but it is much more to be regretted, that in a medicine of such activity, the colleges should not have directed the same proportion of mercury to the fatty matter.

The trituration is more easily performed in flat-bottomed mortars. In the Apothecaries Hall in London, mercury is killed in a cast-iron trough, in which cylinders of the same substance are made to move in a circular direction, but a marble mortar is preferable. The ointment prepared in an iron mortar discolours the skin of the patient using it.

The extinction of mercury in the preparation of mercurial ointment is so troublesome and tedious a process, that the suggestions for facilitating it are almost without number. Even in the past year, several papers on the subject were inserted in the French Pharmaceutical Journals. M. Guibourt made some experiments to compare its extinction by means of egg-oil, oil of sweet almonds, and mercurial ointment, with that by fresh lard. He found that egg-oil possessed no superiority over lard, that sweet almond oil facilitated its extinction somewhat, and mercurial ointment very much. He recommends the mercury to be triturated, first with one-sixteenth of old mercurial ointment, and then with the necessary proportion of lard. Although M. Guibourt ascribes the efficacy of old mercurial ointment in aiding the extinction of the mercury to its being oxygenated, he found, by dissolving the lard in ether, that even in a rancid mercurial ointment the mercury was not oxidized, but in its metallic state, being only minutely divided. The rancidity which mercurial ointment acquires almost as soon as it is made, has led pharmaceutists to attempt its preparation with butter of cocoa, which does not readily become rancid; but M. Baumé could not prepare it with fresh cocoa butter; and with M. Guibourt, the process of M. Planche, who triturates an ounce of mercury with twenty drops of very fresh egg-oil, and then adds an ounce of cocoa butter melted in a hot earthen mortar, rubbing for an hour without interruption, did not succeed.

M. Simonin has also made some observations on the subject, of which the most important is, that fresh axunge, which either could not extinguish mercury, or only after very long trituration, did it in the course of a few minutes, after having been spread over an earthenware plate, so as to expose a large surface, and placed for fifteen days in a cellar not too moist, whose temperature was 50° Fahr. Without having become rancid, it had undergone a modification not as yet appreciated. An ingenious pupil also informed me, that the extinction of mercury was very much facilitated by using lard which had been exposed to the light of the sun until it had become rancid.

M. Chevallier, one of the authors of an excellent system of pharmacy, recommends a process, which, he asserts, has been employed with uniform success for five years in his laboratory, and likewise by others. Eight ounces of mercury were put into a bottle, and four ounces of melted lard poured upon it. They were then shaken together until the lard began to cool, and had acquired the consistence of a very thick syrup. It was poured out into an earthenware mortar, and stirred continually with a spathula for ten minutes; four ounces more of lard were added, and the trituration continued. In half an hour the ointment was perfectly prepared.

Off. Prep. of strong mercurial ointment.—Ungt. hydrarg. mitius, *L.* Linim. hydrarg. *L.*

UNGUENTUM HYDRARGYRI MITIUS. *Lond.*
Milder Mercurial Ointment.

Take of The stronger ointment of quicksilver, one pound;
Hogs lard, prepared, two pounds.
Mix them.

LINIMENTUM HYDRARGYRI. *Lond.*
Liniment of Mercury.

Take of Stronger mercurial ointment,
Prepared lard, of each four ounces;
Camphor, one ounce;
Rectified spirit, fifteen minims;
Water of ammonia, four fluidounces.

First rub the camphor with the spirit, then with the lard and mercurial ointment; lastly, having gradually added the water of ammonia, mix all the ingredients together.

UNGUENTUM OXIDI HYDRARGYRI CINEREI. *Ed.*
Ointment of Grey Oxide of Quicksilver.

Take of Grey oxide of quicksilver, one part;
Hogs lard, three parts.
Mix them thoroughly.

ALL these mercurial ointments are principally employed, not with a view to their topical action, but with the intention of introducing mercury in an active state into the circulating system, which may be effected by gentle friction on the sound skin of any part, particularly on the inside of the thighs or legs. For this purpose, these simple ointments are much better suited than the more compounded ones, with turpentine and the like, formerly employed; for, by any acrid substance, topical inflammation is apt to be excited, preventing further friction, and giving much uneasiness. To avoid this, it is necessary, even with the mildest and weakest ointment, to change occasionally the place on which the friction is performed.

UNGUENTUM HYDRARGYRI PRÆCIPITATI ALBI. *Lond.*
Ointment of White Precipitated Quicksilver.

Take of White precipitated quicksilver, one drachm;
Prepared lard, one ounce and a half.

Add the precipitated quicksilver to the lard melted with a slow fire, and mix.

UNGUENTUM HYDRARGYRI SUBMURIATIS AMMONIATI. *Dub.*

Ointment of Ammoniated Submuriate of Quicksilver.

Take of Ammoniated submuriate of mercury, one drachm;
Prepared hogs lard, an ounce and a half.

Add the submuriate of mercury to lard melted and again concreting, and mix them thoroughly.

THIS is a very elegant mercurial ointment, and frequently made use of in the cure of obstinate cutaneous affections.

UNGUENTUM OXIDI HYDRARGYRI RUBRI. *Ed.*

Ointment of Red Oxide of Quicksilver.

Take of Red oxide of quicksilver by nitric acid, in very fine powder, one part;
Hogs lard, eight parts.

Mix them thoroughly.

UNGUENTUM HYDRARGYRI OXYDI NITRICI. *Dub. Lond.*

Ointment of Nitric Oxide of Quicksilver.

Take of Nitric oxide of quicksilver, once ounce;
White wax, two ounces;
Prepared lard, six ounces.

Add the nitric oxide, in very fine powder, to the wax and lard, previously melted together, and mix.

THE oxide should be reduced to very fine powder before it be added to the axunge. This is an excellent stimulating ointment, often of very great service in indolent ill-conditioned sores, when we wish to excite them to greater action. As an eye-ointment, its effects are most remarkable, in the cure of all inflammations of the tunica conjunctiva, and more particularly when there is a thickening and swelling of the inner membrane of the palpebræ. In such cases, it seems to act with much greater certainty, if applied immediately after the eyelids have been scarified. In inflammation, accompanied with specks, it has a most powerful effect in removing both. It is also useful in all those ophthalmias which so frequently appear after small pox, measles, and eruptive diseases of the hairy scalp. It is used in the same quantity, and in the same manner as the *Unguentum nitratis hydrargyri*; and if it prove too stimulating, it may be diluted with axunge. It is useful to know that if it be mixed with any ointment containing resin, the red oxide is very quickly converted into the black, and the ointment gradually loses its red colour, and passes through olive-green to black.

UNG. HYDRARGYRI NITRATIS, vel UNG. CITRINUM. *Dub.*

Ointment of Nitrate of Quicksilver, or Citrine Ointment.

Take of Purified quicksilver, one ounce;
Nitric acid, eleven drachms and a half;
Olive oil, one pint;
Prepared hogs lard, four ounces.

Dissolve the quicksilver in the acid; then mix in the solution with the oil and lard, melted together, and make into an ointment, in the same manner as the ointment of nitric acid.

UNGUENTUM HYDRARGYRI NITRATIS. *Lond.*

Ointment of Nitrate of Quicksilver.

Take of Purified quicksilver, one ounce;
Nitric acid, eleven fluidrachms;
Prepared hogs lard, six ounces;
Olive oil, four fluidounces.

First dissolve the quicksilver in the acid, and then mix the solution, while hot, with the lard and oil previously melted together.

UNGUENTUM NITRATIS HYDRARGYRI FORTIUS; vulgo UNGUENTUM CITRINUM. *Ed.*

Stronger Ointment of Nitrate of Quicksilver, commonly called *Citrine Ointment.*

Take of Purified quicksilver, one part;
Nitrous acid, two parts;
Olive oil, nine parts;
Hogs lard, three parts.

Dissolve the quicksilver in the acid; then carefully beat up the solution in a glass mortar, with the lard and oil when getting stiff, after having been melted together.

UNGUENTUM NITRATIS HYDRARGYRI MITIUS. *Ed.*

Milder Ointment of Nitrate of Quicksilver.

This is prepared in the same way (as the Ointment of nitrate of quicksilver,) with three times the quantity of oil and hogs lard.

THIS ointment, which at first has a moderate consistence and a fine golden colour, soon gets very hard, even pulverizable, and becomes gradually green, the change commencing at the surface.

The preparation of this ointment has long engaged the attention of pharmaceutists both in this country and on the Continent, as they have never been able to give it the fine golden colour and permanent softness desired, and which is possessed by an empirical remedy sold under the name of the Golden Eye-Ointment. The great inconvenience of its becoming hard and acquiring a slate-grey colour, has been generally ascribed to excess of acid hyperoxidizing the fatty substances, and the object has been to reduce the quantity of acid, and to prepare it at the lowest possible temperature. But this appears to be a mistake; for the most perfect ointment of this kind which I have ever seen, and in no respect inferior to the secret preparation, was made by my friend and namesake, who with great liberality has allowed me to publish his process.

Take of nitrous acid 12 ounces, mercury 4 ounces, olive oil 26½ ounces, axunge 15 ounces; dissolve the mercury in the acid, and pour the solution while still hot into the lard melted in the oil, and also still hot, and mix in a vessel capable of containing five times the quantity, as a violent effervescence takes place. If it should not froth up, the action must be assisted by heat. Mr Duncan has not succeeded in making the weaker ointment; and he found that the stronger ointment could not be diluted without injuring its properties. The difference between this and the officinal formulæ are, the much larger proportion of acid employed, and the higher temperature applied at the time of the mixture of the mercurial solution with the oily substances. The violent effervescence probably arises from a disengagement of nitric oxide, and it would appear that the rapid oxygenizement did not harden the oily substances so much as a slower change, and that a higher oxygenizement of the nitrate of mercury prevented its decomposition and gradual conversion into the state of protoxide, on which the slate colour of the officinal ointment, when long kept, probably depends. Mr Duncan now prepares it entirely with lard, and it preserves equally the desired colour and consistence.

When the citrine ointment gets too hard, it should be softened by triturating it with lard or oil; for, if melted with them, it very soon hardens again.

Med. use.—This ointment has the very best effects in herpes, porrigo, and similar obstinate cutaneous affections, and is almost specific in psorophthalmia, in those slight excoriations of the tarsi, attended with extreme itching, and in all the inflammations of the eyes, attended by eruptive disorders of the hairy scalp or face. It is most conveniently and effectually used, by rubbing a piece of the size of half a garden pea, with the point of a hair pencil, over the tarsi, among the roots of the ciliæ, and allowing a small quantity to get on the inner membrane of the palpebræ. In obstinate cases, a weak solution of muriate of mercury, used as a collyrium, along with this ointment, proves a most powerful remedy. Baumé recommends it to be rubbed to the extent of two drachms upon the legs and wrist for nine days for the cure of scabies, and says it sometimes excites salivation.

UNGUENTUM CARBONATIS PLUMBI. *Ed.*

Ointment of Carbonate of Lead.

Take of Simple ointment, five parts;
Carbonate of lead, one part.
Mix them thoroughly.

UNGUENTUM PLUMBI CARBONATIS. *Dub.*

Ointment of Carbonate of Lead.

Take of Carbonate of lead in very fine powder, two ounces;
Ointment of white wax, one pound.
Make into an ointment.

THIS is a cooling desiccative ointment, of great use when applied to excoriated surfaces.

UNGUENTUM ACETATIS PLUMBI. *Ed.*

Ointment of Acetate of Lead.

Take of Simple ointment, twenty parts;
Acetate of lead, in very fine powder, one part.

Dub.

Take of Ointment of white wax, one pound and a half;
Acetate of lead, one ounce.
Make into an ointment.

CERATUM PLUMBI ACETATIS. *Lond.*

Cerate of Acetate of Lead.

Take of Acetate of lead, in powder, two drachms;
White wax, two ounces;
Olive oil, half a pint.
Melt the wax in seven fluidounces of the oil, and gradually add to these the acetate of lead, separately triturated with the rest of the oil, and stir the mixture with a wooden spatula until they unite.

THESE are also excellent cooling ointments, of great use in many cases.

CERATUM PLUMBI COMPOSITUM. *Lond.*

Compound Cerate of Lead.

Take of Solution of subacetate of lead, two fluidounces and a half;
Yellow wax, four ounces;
Olive oil, nine fluidounces;
Camphor, half a drachm.

Mix the melted wax with eight fluidounces of the oil, then remove from the fire; and as soon as the mixture begins to thicken, pour in, by degrees, the solution of subacetate of lead, and stir constantly, with a wooden spatula, until it be cold; then mix in the camphor, previously melted in the rest of the oil.

THIS composition was much recommended by M. Goulard. It differs from the other saturnine ointments in consistence, and in containing more lead.

CERATUM SAPONIS. *Lond.*

Soap Cerate.

Take of Hard soap, eight ounces;
Yellow wax, ten ounces;
Semi-vitrified oxide of lead, powdered, one pound;
Olive oil, one pint;
Vinegar, one gallon.

Boil the vinegar with the oxide of lead, over a slow fire, constantly stirring, until they unite; then add the soap, and repeat the boiling in the same manner, until the moisture be entirely evaporated; and, lastly, mix with them the wax previously melted with the oil.

IT is doubtful whether this composition be consonant to the rules of pharmaceutic chemistry; for the acetate of lead formed must be decomposed by the soap, giving rise to acetate of potass and stearate of lead. These are afterwards blended mechanically with the wax and oil. Mr Wilson mentions a different way of preparing it at St Bartholomew's Hospital, where it was much used by Mr Pott. The litharge and vinegar were boiled down carefully till they became glutinous; the soap, wax and oil were melted together, and when both were cooling and merely fluid, they were mixed by incessant stirring. It was used to fractured limbs, as combining the properties of an adhesive plaster with those of a saturnine; but it is a dangerous application while any susceptibility of inflammation remains. As a covering to strumous glands and scrofulous swellings it is less doubtful.

CERATUM CARBONATIS ZINCI IMPURI. *Ed.*

Cerate of Impure Carbonate of Zinc.

Take of Simple cerate, five parts;
Prepared impure carbonate of zinc, one part.
Mix them thoroughly.

CERATUM CALAMINÆ. *Lond.*

Cerate of Calamine.

Take of Calamine, prepared,
Yellow wax, of each half a pound;
Olive oil, one pint.
Mix the oil with the melted wax, then remove from the fire; and, as soon as the mixture begins to thicken, add the calamine, and stir the cerate constantly until it be cold.

UNGUENTUM CALAMINÆ. *Dub.*

Calamine Ointment.

Take of Ointment of yellow wax, five pounds;
Prepared and dried impure carbonate of zinc, one pound.
Triturate the carbonate of zinc until it be perfectly comminated, then add it to the ointment of yellow wax, and mix.

THESE compositions resemble the cerate which Turner strongly recommends in cutaneous ulcerations and excoriations, and which has been usually distinguished by his name. They appear, from experience, to be excellent epulotics; and, as such, are frequently made use of in practice.

UNGUENTUM OXIDI ZINCI IMPURI. *Ed.*

Ointment of Impure Oxide of Zinc.

Take of Simple liniment, five parts;
Prepared impure oxide of zinc, one part.
Mix them thoroughly.

UNGUENTUM TUTIÆ. *Dub.*

Ointment of Tutty.

Take of Ointment of white wax, ten ounces;
Prepared tutty, two ounces.
Make into an ointment.

THIS is an exsiccant ointment of a grey colour.

UNGUENTUM OXIDI ZINCI. *Ed.*

Ointment of Oxide of Zinc.

Take of Simple liniment, six parts;
Prepared oxide of zinc, one part.
Mix them thoroughly.

Dub.

Take of Ointment of white wax, one pound;
Oxide of zinc, prepared like chalk, two ounces.
Melt the ointment, and mix in the oxide well powdered.

UNGUENTUM ZINCI. *Lond.*

Ointment of Zinc.

Take of Oxide of zinc, one ounce;
Prepared lard, six ounces.
Mix.

THESE white ointments are chiefly used in affections of the eye, particularly in those cases where redness arises rather from relaxation than from active inflammation.

UNGUENTUM SULPHURIS. *Lond.*

Sulphur Ointment.

Take of Sublimed sulphur, three ounces;
Prepared lard, half a pound.
Mix.

Ed.

Take of Hogs lard, four parts;
Sublimed sulphur, one part.
Mix them thoroughly.

Dub.

Take of Prepared lard, four pounds;
Sublimed sulphur, one pound.
Powder the sulphur by trituration, and then mix with the lard.

UNGUENTUM SULPHURIS COMPOSITUM. *Lond.*

Compound Sulphur Ointment.

Take of Sublimed sulphur, half a pound;
White hellebore root, in powder, two ounces;
Nitrate of potass, one drachm;
Soft soap, half a pound;
Prepared lard, a pound and a half.
Mix.

SULPHUR is a certain remedy for scabies, and more safe than mercury. A pound of ointment serves for four unctions. The patient is to be rubbed every night; a fourth part of the body at each time. Though the disease may be thus cured by a single application, it is in general advisable to touch the parts most affected for a few nights longer, and to conjoin with the frictions the internal use of sulphur.

The compound ointment is the more efficacious of the two. It is also generally believed that the simple ointment is better when made with pounded roll sulphur, than with sublimed sulphur.

UNGUENTUM IODINII. *Dub.*
Ointment of Iodine.

Take of Iodine, a scruple;
Prepared hogs lard, an ounce.
Rub together to form one ointment.

IODINE ointment, of the strength here ordered, has an orange brown colour, and that peculiar smell which is characteristic of iodine. When rubbed on the skin, it gives it an orange colour, which however disappears without desquamation; and if its application be continued for some time, and its evaporation be prevented by covering the part, it has a slight tendency to excite pustules. But even without producing this effect, it often evinces unequivocal power in discussing tumours, by promoting the absorption of newly deposited lymph, as in bronchocele and strumous glands, as mentioned by Dr Coindet, and confirmed by the experience of myself, as well as of others.

UNGUENTUM POTASSAE HYDRIODATIS. *Dub.*
Ointment of Hydriodate of Potass.

Take of Hydriodate of potass, one scruple;
Prepared hogs lard, one pound.
Triturate together to form an ointment.

THIS is another mode of applying iodine externally, and is that commonly preferred, possibly because it does not colour the skin. I have little experience of it, having always employed the iodine ointment.

UNGUENTUM ACIDI NITROSI. *Ed.*
Ointment of Nitrous Acid.

Take of Hogs lard, one pound;
Nitrous acid, six drachms;
Mix the acid gradually with the melted axunge, and diligently beat the mixture as it cools.

UNGUENTUM ACIDI NITRICI. *Dub.*
Ointment of Nitric Acid.

Take of Olive oil, one pound;
Prepared hogs lard, four ounces;
Nitric acid, five drachms and a half by measure.

Melt the oil and lard together in a glass vessel, and when congealing, add the acid, and stir them constantly with a glass rod, until they get stiff.

The oil and axunge in this ointment are oxidized; for during the action of the acid upon them, there is a great deal of nitric oxide gas disengaged. It acquires a yellowish colour, and a firm consistency, and forms an efficacious and cheap substitute, in slight cutaneous affections, for the ointment of nitrate of mercury.

Unguentum acidi sulphurici. *Dub.*
Ointment of Sulphuric Acid.

Take of Sulphuric acid, one drachm;
Prepared hogs lard, one ounce.
Mix.

In making this ointment, there is a chemical reaction between the acid and lard, the latter becoming partially charred, and the former partially converted into sulphurous acid. It thus has a dark colour, and a fœtid odour. It was a favourite remedy with my father for the cure of scabies; but it is evidently liable to the great objection of corroding the clothing of the patient.

Emplastrum ceræ. *Lond.*
Wax Plaster.

Take of Yellow wax,
Prepared suet, of each three pounds;
Yellow resin, one pound.
Melt them together, and strain.

Emplastrum simplex. *Ed.*
Simple Plaster.

Take of Yellow wax, three parts;
Mutton suet,
Pine resin, each two parts.
Melt the whole with a gentle heat, and stir the mixture well, until it stiffen on cooling.

This composition, as well as several which follow, is only a solid ointment or hard ointment, according to M. Deyeux, the chemist who has most insisted upon the difference between mixtures of pulverised bodies with resin and wax, and the proper metallic plasters, in which the nature of the fats and oils is altered.

Med. use.—This is chiefly used to support the discharge from a part which has been blistered, and was therefore formerly called *Emplastrum attrahens.* Sometimes, however, it irritates too much, on account of the resin; and hence, when designed only for dressing blisters, the resin ought to be entirely omitted, unless where a continuance of the pain and irritation, excited by the vesicatory, is required. Indeed, plasters of any kind are not very proper for dressing blisters; their consistence makes them sit uneasy, and their adhesiveness renders the taking of them off painful. Cerates, which are softer and less adhesive, appear much more eligible.

Off. Prep.—Empl. cantharidis, *L.*

EMPLASTRUM AMMONIACI. *Lond. Ed.*
Plaster of Ammoniac.

Take of Strained gum ammoniac, five ounces, (five parts, *Ed.*)
Acetic acid, half a pint, (eight parts, *Ed.*)

Dissolve the ammoniac in the vinegar, then evaporate the solution in an iron pot, by the heat of a water-bath, stirring it constantly till it acquire a proper thickness.

Dub.

Take of Pure gum ammoniac, five ounces;
Vinegar of squills, half a pound.

Dissolve the ammoniac in the vinegar, then evaporate the liquor by heat with constant agitation, until it acquire the proper thickness.

This plaster differs in composition from all the others, as it is a mere solution, or softening of gum resin, with acetic acid. I am not aware of the reasons why the London and Edinburgh Colleges direct the solution and evaporation to be conducted in an iron pot, as they heat it in a steam bath; but I know that the plaster thus made acquires an unpleasant dark colour, from being impregnated with iron; whereas, when prepared in a glass or earthenware vessel, it has a yellowish-white colour, and more pleasant appearance.

The best mode of preparing it is to add to the gum ammoniac, in a Wedgwood mortar, the acid, gradually incorporating each portion thoroughly before more be added, and then evaporating the solution in an earthen evaporating vessel, placed in a water bath.

Med. use.—It is applied over indolent tumours, and in pains of the joints. It acts by its stimulating virtue, which is often so considerable as to excite a full crop of inflamed papulæ. It sometimes is too stimulating. I have described a fatal case of diffuse inflammation following its application in a knee case.

EMPLASTRUM AROMATICUM. *Dub.*
Aromatic Plaster.

Take of Frankincense, three ounces;
Yellow wax, half an ounce;
Cinnamon bark, in powder, six drachms;
Essential oil of pimento,
——— lemon, each two drachms.

Melt the frankincense and wax together, and strain; when getting stiff, from being allowed to cool, mix in the powdered cinnamon and oils, and make a plaster.

THIS has been considered as a very elegant stomach plaster. As compositions of this kind, on account of their volatile ingredients, do not keep, they are only made occasionally. They should be but moderately adhesive, that they may not irritate the skin, and may without difficulty be frequently renewed; which is necessary, in order to their producing any considerable effect.

EMPLASTRUM CANTHARIDIS. *Lond.*
Plaster of Spanish Flies.

Take of Spanish flies, in very fine powder, one pound;
Wax plaster, one pound and a half;
Prepared hogs lard, one pound.

Having melted the plaster and lard together, and removed them from the fire, sprinkle in the flies a little before they become firm, and mix the whole together.

Dub.

Take of Cantharides in very fine powder,
Yellow wax, of each one pound;
Hogs lard,
Mutton suet, of each half a pound;
Yellow resin, four ounces.

To the wax, fat, and resin melted together, a little before they stiffen on being allowed to cool, sprinkle in the cantharides, and mix so as to form a plaster.

EMPLASTRUM CANTHARIDIS VESICATORIÆ. *Ed.*
Plaster of Cantharides.

Take of Mutton suet,
Yellow wax,
White resin,
Cantharides, in very fine powder, each equal weights.

Mix the powder with the other ingredients, previously melted together, and removed from the fire. Stir the mixture constantly, until it get stiff on cooling.

In making these blistering plasters, from an uncautious application of heat, the cantharides sometimes lose their vesicating powers; therefore it is customary, after the blister is spread, to cover its surface with powdered cantharides. The desired effect is also more speedy and certain, if the part to which it is to be applied be well bathed with hot vinegar; and the blister is more easily removed if a bit of thin gauze be interposed between it and the skin.

It is needless here to enter into all the circumstances in which blisters are useful. After bloodletting they are the most powerful means of combating internal inflammation, whether acute or chronic; and they are powerful stimuli in diseases of torpor or exhaustion. The greatest inconvenience attending the use of cantharides is its tendency to excite strangury, which is best counteracted by the copious use of diluents.

Off. Prep.—Empl. calefaciens, *D.*

EMPLASTRUM CALEFACIENS. *Dub.*
Calefacient Plaster.

Take of Plaster of cantharides, one part;
Burgundy pitch, seven parts.
Melt together, with a moderate heat, and make into a plaster.

This is a very convenient plaster, being more active as a stimulant and rubefacient than the simple Burgundy pitch plaster, while it will scarcely ever raise a blister.

EMPLASTRUM CANTHARIDIS VESICATORIÆ COMPOSITUM. *Ed.*
Compound Plaster of Cantharides.

Take of Venice turpentine, eighteen parts;
Burgundy pitch,
Cantharides, each twelve parts;
Yellow wax, four parts;
Subacetate of copper, two parts;
Mustard seed,
Black pepper, each one part.
Having first melted the pitch and wax, add the turpentine, and to these, still hot, add the other ingredients, reduced to a fine powder, and mixed, and stir the whole carefully together, until it become stiff on cooling.

This is supposed to be a most infallible blistering plaster. It certainly contains a sufficient variety of stimulating ingredients.

EMPLASTRUM CUMINI. *Lond.*
Cumin Plaster.

Take of Cumin seeds,
Caraway seeds,
Bay berries, of each three ounces;
Burgundy pitch, three pounds;
Yellow wax, three ounces;
Olive oil,
Water, of each a fluidounce and a half.

Melt the pitch and wax together, and mix with them the dry ingredients, powdered, likewise the olive oil and the water, and boil down to a proper consistence.

THIS plaster has been recommended as a moderately warm discutient, and is directed by some to be applied to the hypogastric region, for strengthening the viscera, and expelling flatulencies.

EMPLASTRUM PICIS COMPOSITUM. *Lond.*
Compound Pitch Plaster.

Take of Burgundy pitch, two pounds;
Frankincense, one pound;
Yellow resin,
Yellow wax, of each four ounces;
Expressed oil of mace, one ounce;
Olive oil,
Water, of each two fluidounces.

To the pitch, resin, and wax melted together, add first the frankincense, and then the oil of mace, olive oil and water. Mix the whole, and boil down to a proper consistence.

THIS is the simple burgundy pitch plaster, a very common and useful domestic application, when a continued local stimulus is wanted, without much risk of exciting blisters or pustules. Some irritable habits are however unable to support it. This plaster is a very useful application in the catarrhal complaints of infants, and even of adults; and in slight affections of the liver, and rheumatic pains of the trunk of the body. It is generally worn for several days, or until it drops off, in consequence of the perspiration confined beneath it.

EMPLASTRUM OXIDI PLUMBI SEMIVITREI. *Ed.*
Plaster of the Semivitrified Oxide of Lead.

Take of Semi-vitrified oxide of lead, in powder, one part;
Olive oil, two parts;
Water, what is required.

Boil them, constantly stirring the mixture till the oil and oxide unite.

EMPLASTRUM LITHARGYRI. *Dub.*
Litharge Plaster.

Take of Litharge, in very fine powder, five pounds;
Olive oil, one gallon;
Boiling water, two pints.

Mix them at a high temperature, (200° to 212°,) and stir them until the oil and litharge unite, so as to form a plaster, occasionally supplying the waste of the water with fresh additions.

EMPLASTRUM PLUMBI. *Lond.*
Lead Plaster.

Take of Semi-vitrified oxide of lead in very fine powder, five pounds;
Olive oil, one gallon;
Water, two pints.

Boil together with a slow fire, constantly stirring them until the oil and oxide of lead acquire by their union the thickness of a plaster. But it will be necessary to add a little more boiling water, if that employed at first be almost all consumed before the end of the operation.

OXIDES of lead, boiled with oils, unite with them into a plaster of an excellent consistence, and forming a proper basis for several other plasters.

In the boiling of these compositions, a quantity of water must be added, to prevent the plaster from burning and growing black. Such water as it may be necessary to add during the boiling must be previously made hot; for cold liquor would not only prolong the process, but likewise occasion the matter to explode, and be thrown about with violence, to the great danger of the operator: this accident will equally happen upon the addition of hot water, if the plaster be extremely hot. It is therefore better to remove it from the fire a little before each addition of water.

These plasters, which have been long known under the name of *Diachylon*, are common applications in excoriations of the skin, slight flesh wounds, and the like. They keep the part soft and somewhat warm, and defend it from the air.

Off. Prep. of litharge plaster.—Emplast. oxidi ferri rubri, *E.* E. thuris, *D.* E. hydrargyri, *E. L.* E. opii, *E. L. D.* E. gummos. *E.* E. galbani, *L. D.* E. assæfœtidæ, *E.* E. saponis, *L. E. D.* E. saponis comp. *D.* E. resinos. *L. E. D.*

EMPLASTRUM RESINOSUM. *Ed.*
Resinous Plaster.

Take of Plaster of semi-vitrified oxide of lead, five parts;
White resin, one part.

Melt with a gentle fire, and stir constantly until they stiffen on cooling.

EMPLASTRUM LITHARGYRI CUM RESINA. *Dub.*

Litharge Plaster with Resin.

Take of Litharge plaster, three pounds and a half;
Yellow resin, half a pound.

To the litharge plaster melted with a moderate heat, add the resin, reduced to a very fine powder, that it may melt quickly, and make a plaster.

EMPLASTRUM RESINÆ. *Lond.*

Plaster of Resin.

Take of Yellow resin, half a pound;
Lead plaster, three pounds.

Add the resin, in powder, to the lead plaster, melted with a slow fire, and mix.

ADHESIVE plaster is used for keeping on other dressings; for retaining the edges of recent wounds together when we are endeavouring to cure them by the first intention, and especially for giving mechanical support to new flesh; and contracting the size of ulcers, in the manner recommended by Mr Baynton, for the cure of ulcers of the legs, a mode of treatment so efficacious, that it has entirely changed the character of these sores.

EMPLASTRUM SAPONIS. *Lond. Dub.*

Soap Plaster.

Take of Hard soap, sliced, half a pound;
Lead plaster, three pounds.

Mix the soap with the melted plaster, and boil them to the thickness of a plaster.

EMPLASTRUM SAPONACEUM. *Ed.*

Saponaceous Plaster.

Take of Plaster of semi-vitrified oxide of lead, four parts;
Gum plaster, two parts;
Hard soap, sliced, one part.

To the plasters, melted together, add the soap; then boil for a little.

THE soap is not boiled with the plaster. It is previously shaved down; and when the plaster is liquefied the soap is incorporated.

These are considered to be mild discutients.

Off. Prep. of soap plaster.—Empl. belladonnæ, *D.* Empl. saponis comp. *D.*

EMPLASTRUM SAPONIS COMPOSITUM vel ADHÆRENS. *Dub.*
Compound Soap Plaster, or *Adhesive Plaster.*

Take of Soap plaster, two ounces;
Lead plaster with resin, three ounces.
Make it into a plaster, which is to be spread melted upon linen.

THE common resinous plaster is in cold weather too brittle, and apt to crack off from the linen on which it is spread, but by combining it in due proportion with soap plaster, it acquires greater pliability, without losing its adhesive property. In fact, this is the plaster commonly spread by a machine on webs of linen, and sold under the name of Adhesive plaster.

EMPLASTRUM ASSÆ FŒTIDÆ. *Ed.*
Plaster of Assafœtida.

Take of Plaster of semi-vitrified oxide of lead,
Assafœtida, each two parts;
Galbanum,
Yellow wax, each one part.
Melt the plaster and wax, and add to the mixture the gum-resins previously melted and strained, and mix the whole thoroughly.

THIS plaster is applied to the umbilical region, or over the whole abdomen in hysteric cases; and sometimes with good effect.

EMPLASTRUM BELLADONNÆ. *Dub.*
Plaster of Deadly Nightshade.

Take of Inspissated juice of belladonna, one ounce;
Soap plaster, two ounces.
Make into a plaster.

WITHOUT having any experience either of its pharmacy or medical virtue, I may venture to state my doubts concerning this preparation. The expressed juices, besides water, of which they chiefly consist, contain principles, as mucilage and albumen, which have no tendency to unite with oily substances or plasters. Hence, on the evaporation of the water, there will be considerable difficulty in effecting the union. Also the expressed juices of the narcotic plants contain so little of the active ingredient, as to be almost inert.

In regard to belladonna, M. Recluz got from the expressed juice of a pound of the leaves, one ounce and a half of very soft extract, and by digestion from one pound of the dry leaves, four ounces and a half of pilular consistency. I should consider it to be an improvement to boil the recent leaves in the melted plaster until they become crisp, and then to separate by strong expression, as in making savine ointment, or simply to stir a due proportion of the powder of belladonna leaves into melted plaster. There would be in this case no mechanical irritation from the powder.

EMPLASTRUM GUMMOSUM. *Ed.*
Gum Plaster.

Take of Plaster of semi-vitrified oxide of lead, eight parts;
Gum ammoniacum,
Galbanum,
Yellow wax, each one part.

Melt the plaster and wax, and add to the mixture the gum resins previously melted and strained, and mix the whole thoroughly.

EMPLASTRUM GALBANI. *Dub.*
Plaster of Galbanum.

Take of Plaster of litharge, two pounds;
Galbanum, half a pound;
Yellow wax, sliced, four ounces.

Add the plaster and wax to the galbanum melted, and then melt the whole together with a moderate heat.

EMPLASTRUM GALBANI COMPOSITUM. *Lond.*
Compound Plaster of Galbanum.

Take of Strained galbanum, eight ounces;
Plaster of lead, three pounds;
Turpentine, ten drachms;
Frankincense, in powder, three ounces.

With the galbanum and turpentine melted together, mix first the frankincense, and afterwards the litharge plaster, melted with a very slow fire, and make a plaster.

ALL these plasters are used as digestives and suppuratives; particularly in abscesses, after a part of the matter has been maturated and discharged, for supporting or discussing the induration which remains. Mr Wilson also recommends it from his own observation, "applied over the whole lumbar region of children, in rickety affections, accompanied with great weakness in the lower extremities, and as a covering in enlarged joints." It is also useful in anomalous or arthritic pains of the ligaments, renewing it every eight or ten days.

EMPLASTRUM OPII. *Lond.*
Plaster of Opium.

Take of Hard opium, in powder, half an ounce;
Frankincense, in powder, three ounces;
Lead plaster, one pound;
Water, half a pint.

Add the opium and frankincense to the melted plaster, and boil down with a gentle fire till it acquire the consistence of a plaster.

Ed. Dub.

Take of Opium, in powder, half an ounce;
Burgundy pitch, three ounces;
Plaster of semi-vitrified oxide of lead, one pound.

Add the opium and pitch to the melted plaster, and (carefully, *Dub.*) mix them thoroughly.

OPIUM plaster is applied in rheumatisms and other local pains, and is supposed to act by diminishing the sensibility of the part by contiguous sympathy or absorption.

EMPLASTRUM HYDRARGYRI. *Ed.*
Plaster of Quicksilver.

Take of Olive oil,
White rosin, each one part;
Purified quicksilver, three parts;
Plaster of semi-vitrified oxide of lead, six parts.

Melt the oil and resin together, and when this mixture is cold, let the quicksilver be rubbed with it till the globules disappear; then add, by degrees, the litharge plaster melted, and let the whole be accurately mixed.

EMPLASTRUM HYDRARGYRI. *Lond.*
Plaster of Quicksilver.

Take of Purified quicksilver, three ounces;
Sulphuretted oil, one fluidrachm;
Litharge plaster, one pound.

Triturate the quicksilver with the sulphuretted oil until the globules disappear; then gradually add the lead plaster melted, and mix the whole together.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO. *Lond. Dub.*
Plaster of Gum Ammoniac with Quicksilver.

Take of Gum ammoniac strained, one pound;
Purified quicksilver, three ounces;
Sulphuretted oil, a fluidrachm.

Triturate the quicksilver with the sulphuretted oil, until its globules disappear; then gradually add the gum ammoniac melted, and mix them together.

Dub.

Take of Pure gum ammoniac, one pound;
Purified quicksilver, three ounces;
Common turpentine, two drachms.

Triturate the quicksilver with the turpentine, until the globules entirely disappear; then gradually add the ammoniac, melted by a gentle heat, and rub them together until they unite.

In the one of these preparations, the killed mercury is united with common lead plaster, in the other with strained gum ammoniac. In both, the London College orders the empyreumatic sulphuretted oil for killing the mercury; but it is very offensive, and not, so far as I know, possessed of any advantage over turpentine, or rosin and oil.

These mercurial plasters are considered as powerful resolvents and discutients. They act both generally by affording a continued stimulus to the part to which they are applied, and specifically; the mercury being sometimes introduced into the habit in such quantity as to affect the mouth. Syphilitic pains in the joints and limbs, nodes, tophi, and beginning indurations, are said to yield to them occasionally; and they are sometimes worn with advantage in chronic enlargement and pains of the liver. The ammoniacal plaster is the more stimulating; the common plaster more likely to produce the specific effects of mercury.

EMPLASTRUM OXIDI FERRI RUBRI. *Ed.*

Plaster of Red Oxide of Iron.

Take of Plaster of semi-vitrified oxide of lead, twenty-four parts;
White rosin, six parts;
Yellow wax,
Olive oil, each three parts;
Red oxide of iron, in powder, eight parts.

Grind the red oxide of iron with the oil, and then add it to the other ingredients, previously melted, and mix the whole thoroughly.

EMPLASTRUM THURIS. *Dub.*

Plaster of Frankincense.

Take of Plaster of litharge, two pounds;
Frankincense, half a pound;
Red oxide of iron, three ounces.

Sprinkle the oxide into the plaster and frankincense, melted together, stirring the mixture at the same time, and make into a plaster.

This plaster is used in weakness of the large muscles, as of the loins; and its effects seem to proceed from the mechanical support given to the part, which may also be done by any other plaster that adheres with equal firmness.

TABLE,

Shewing the Proportion of ANTIMONY, OPIUM, QUICKSILVER, ARSENIC and IODINE, *contained in some of their Compounds.*

TARTRATE OF ANTIMONY.

	One grain in
Wine of Tartarized Antimony contains one grain of tartarized antimony in four fluidrachms. *Lond.*	228
Wine of Tartrate of Antimony contains two grains of tartrate of antimony in each ounce. *Ed.*	240
Liquor of Tartar Emetic contains two grains of tartar emetic in each ounce. *Dub.*	240

OPIUM.

Pills of Storax, in five grains of the mass, contain one grain of opium. *Dub.*	5
Pills of Soap with Opium contain one grain of opium in five. *Lond. Dub.*	5
Vinegar of Opium, as ascertained by evaporation, contains seven grains and a half of extract in each drachm; and twenty drops of the vinegar are equal to thirty of the tincture of opium. *Dub.*	8
Compound Powder of Ipecacuan contains one grain of opium in ten grains. *Lond. Dub.*	10
Powder of Ipecacuan and Opium contains six grains of opium in each drachm, or one grain in ten. *Ed.*	10
Powder of Burnt Horn with Opium contains one grain of opium in ten. *Lond.*	10
Opiate Pills contain six grains of opium in each drachm, or a pill of five grains contains half a grain of opium. *Ed.*	10
Opiate Powder of Ed. contains one grain in ten.	10
Tincture of Opium contains, in a drachm measure, about four grains and a half. *Dub.* The tincture of *Lond.* is made with two ounces and a half of dry opium in powder, to two pinst of proof spirit, which is nearly of the same strength.	12
Tincture of Opium is made with two scruples of opium to each ounce of the liquid, or with five grains to each drachm; but a drachm of the tincture appears, by evaporation, to contain about three grains and a half of opium. *Ed.*	17

	One grain in
Wine of Opium of Lond. and Dub. contains one ounce of opium in the pint.	15
Compound Powder of Kino contains a grain of opium in a scruple. *Lond. Dub.*	20
Tincture of Soap and Opium is made with one scruple of opium in each ounce of the liquid. *Ed.*	24
Confection of Opium contains about one grain of opium in twenty-five. *Dub.*	25
Confection of Opium coutains one grain of opium in about thirty-six grains. *Lond.*	36
Opiate Electuary contains in each drachm about a grain and a half of opium. *Ed.*	40
Compound Powder of Chalk with Opium contains one grain of opium in two scruples. *Lond. Dub.*	40
Ammoniated Tincture of Opium is made with about eight grains in each ounce of the liquid, or with about one grain in the drachm. *Ed.* Scotch paregoric.	60
Troches of Liquorice with Opium contain about one grain of opium in each drachm. *Ed.*	60
Compound Electuary of Catechu contains in each ounce about two grains and a half of opium; for one grain of opium is contained in one hundred and ninety-three grains. (two ?) *Ed.*	192
Compound Electuary of Catechu contains in each ounce about two grains and a half of opium. *Dub.*	192
Camphorated Tincture of Opium is made with two grains of opium in each ounce of liquid. *Ed.* English paregoric.	240
Camphorated Tincture of Opium, or *Paregoric Elixir*, contains in four drachms and a half, by measure, very nearly one grain of opium. *Dub.*	270
QUICKSILVER.	
Quicksilver Pills contain one grain of quicksilver in three grains. *Lond.*	3
Quicksilver Pills contain in six grains two of quicksilver. *Dub.*	3
Quicksilver Pills contain nearly fifteen grains of quicksilver in each drachm. Each pill contains one grain of quicksilver. *Ed.*	4
Compound Pills of Submuriate of Quicksilver contain a grain of submuriate of quicksilver in about 4 grains. *Lond.*	4
Compound Pills of Submuriate of Quicksilver contain in about four grains one grain of submuriate of quicksilver. *Ed.*	4
Compound Calomel Pills contain in five or six grains, of calomel and brown antimoniated sulphur, of each one grain. *Dub.*	5
Quicksilver with Magnesia, in five grains, contains two of quicksilver. *Dub.*	2.5
Quicksilver with Chalk contains in five grains two of quicksilver. *Dub.*	2.5
Quicksilver with Chalk contains one grain of quicksilver in about three grains. *Lond.*	3
Stronger Quicksilver Ointment contains one drachm of quicksilver in two drachms. *Lond. Dub.*	2

	One grain in
Weaker Quicksilver Ointment contains in two drachms half a drachm of quicksilver. *Dub.*	4
Weaker Quicksilver Ointment contains one drachm of quicksilver in six drachms. *Lond.*	6
Quicksilver Ointment contains twelve grains of quicksilver in each drachm. *Ed.*	5
Made with double quicksilver, each drachm contains twenty-four grains. *Ed.*	2.5
Ointment of Grey Oxide of Quicksilver contains about fifteen grains of oxide in each drachm. *Ed.*	4
Quicksilver Liniment contains one drachm of quicksilver in about six drachms. *Lond.*	6
Quicksilver Plaster contains about sixteen grains of quicksilver in each drachm. *Ed.*	5
Ointment of Red Oxide of Quicksilver contains in each drachm about seven grains of oxide. *Ed.*	8.5
Ointment of Nitric Oxide of Quicksilver contains in each drachm about six grains and a half of nitric oxide of quicksilver. *Dub.*	9.23
Stronger Ointment of Nitrate of Quicksilver contains in each drachm four grains of quicksilver. *Ed.*	15
Milder Ointment of Nitrate of Quicksilver contains in each drachm a grain and a half of quicksilver. *Ed.*	40
Ointment of Nitrate of Quicksilver contains in each drachm about three of mercury. *Dub.*	20
Ointment of Ammoniated Submuriate of Quicksilver contains in each drachm about five grains of ammoniated submuriate of mercury. *Dub.*	12
Liquor of Oxymuriate of Quicksilver contains one grain of oxymuriate of mercury in two fluidounces. *Lond.*	913

ARSENIC.

	One grain in
Arsenical Liquor contains one grain of sublimed white arsenic in two fluidrachms. *Lond.*	114
Arsenical Liquor contains in each drachm measure about half a grain of white oxide of arsenic. *Dub.*	114
Arsenical Solution contains in each drachm half a grain of oxide. *Ed.*	120

IODINE.

	One grain in
Tincture of Iodine contains five grains of iodine in a fluid-drachm.	9.5

TABLE OF SYNONIMES *of the Medicines, simple and compound, in the Pharmacopœias of London, Dublin, and Edinburgh, with their doses and properties.*

EDINBURGH.	DUBLIN.	LONDON.	*Dose.*	*Nature.*
ACACIAE ARABICAE GUMMI	Gummi Arabicum	Acaciae gummi	1 dr. to 1 oz.	demulcent
Mucilago acaciae Arabicae	Mucilago	Mucilago acaciae	do.	do.
Emulsio acaciae Arabicae	Emulsio Arabica		1 lb. to 2 lb. daily	
Acaciae catechu extractum	Catechu	Catechu extractum	5 grs. to 1 scr.	astringent
Electuarium acaciae catechu	Electuarium catechu comp.		1 scr. to 1 dr.	do.
Tinctura acaciae catechu	Tinctura catechu	Tinctura catechu	1 dr. to 2 drs.	do.
Infusum acaciae catechu		Infusum catechu	1 oz. to 3 oz.	do.
Acetum	Acetum vini	Acetum	1 dr. to 2 drs.	refrigerant
Syrupus aceti			1 dr. to ½ oz.	expectorant
Acidum aceticum tenue	Acetum distillatum	Acidum aceticum dilutum	1 dr. to ½ oz.	refrigerant
Acidum aceticum forte	Acidum aceticum	Acidum aceticum fortius	stimulant, external	
Acidum aceticum aromaticum			do.	
Acidum aceticum camphoratum	Acidum aceticum camphoratum		do.	
Acidum aceticum scilliticum	Acetum scillae	Acetum scillae	½ dr. to 1 dr.	expectorant
Acidum benzoicum	Acidum benzoicum	Acidum benzoicum	10 gr. to ½ dr.	do.
Acidum citricum crystallizatum	Acidum citricum	Acidum citricum	do.	refrigerant
Acidum muriaticum	Acidum muriaticum	Acidum muriaticum	10 mins. to 40,	do.
	Acidum muriaticum dilutum		½ dr. to 1 dr.	do.
Acidum nitricum	Acidum nitricum	Acidum nitricum	5 mins. to. 20,	tonic
Acidum nitrosum			do.	do.
Acidum nitrosum dilutum	Acidum nitricum dilutum	Acidum nitricum dilutum	4 drs. daily	do.
Unguentum acidi nitrosi	Unguentum acidi nitrici		external	
	Acidum nitro-muriaticum		baths	
	Acidum prussicum		2 mins. to ½ dr.	anodyne ?
Acidum succinicum	Acidum succinicum		refrigerant ?	
Acidum sulphuricum	Acidum sulphuricum venale	Acidum sulphuricum	chemical	
	Acidum sulphuricum purum		do.	
Acidum sulphuricum dilutum	Acidum sulphuricum dilutum	Acidum sulphuricum dilutum	10 mins. to 40,	refrigerant

EDINBURGH.	DUBLIN.	LONDON.	*Dose.* *Nature.*
Acidum sulphuricum aromaticum	Acidum sulphuricum aromaticum		10 mins. to 40, refrigerant
	Unguentum acidi sulphurici		external
Acidum tartaricum	Acidum tartaricum	Acidum tartaricum	10 grs. to 1 scr. acid
Aconiti napelli folia	Aconitum panniculat.	Aconiti folia	1 gr. to 5 grs. anodyne
Succus spissatus acon. nap.	Succus spissatus acon.	Extractum aconiti	½ gr. to 3 grs. do.
Adeps ovillus	Adeps ovillus	Sevum	external, emollient
	Adeps ovil. praep.	Sevum praeparatum	do.
Adeps suillus	Adeps suillus	Adeps	do.
Adeps praeparatus	Adeps suillus praeparatus	Adeps praeparata	do.
Aether nitrosus	Aether nitrosus		diffusible stimulus
Spiritus aetheris nitrosi	Spiritus aethereus nitrosus	Spiritus aetheris nitrici	½ dr. to 1 dr. diuretic
Aether sulphuricus	Aether sulphuricus	Aether rectificatus	½ dr. to 1 dr. diffusible
		Aether sulphuricus	do.
		Oleum aethereum	do.
Aether sulphuricus cum alcohole	Liquor aethereus sulphuricus	Spiritus aetheris sulphurici	½ dr. to 2 dr. stimulant
	Liquor aethereus oleosus	Spiritus aeth. sulph. comp.	do.
Alcohol	Alcohol	Alcohol	½ dr. to 1 dr. diffusible
Alcohol fortius	Spiritus rectificatus	Spiritus rectificatus	2 dr. to 4 dr. stimulant
Alcohol dilutum	Spiritus tenuior	Spiritus tenuior	½ oz. to 1 oz. do.
Allium cepa	Allium cepa		cataplasm, stimulant
Allii sativi radix	Allium sativum	Allii radix	cataplasm, stimulant
Aloes extractum			5 grs. to 20, purgative
a. Aloe hepatica	Aloe hepatica		do.
	Aloes hepat. extract.	Extract. aloes purif.	do.
b Aloe socotorina	Aloe socotorina	Aloes spicatae extractum	do.
	Pulvis aloes compositus	Pulvis aloes compositus	10 grs. to 1 scr. purgative
	Pulvis aloes cum canella		do.
Pilulae aloeticae	Pilulae aloes compositae	Pilulae aloes compositae	do.
Pilulae aloes et assafoetidae			do. antispasmodic
Pilulae aloes cum colocynthide	Pilulae colocynthidis compositae		10 grs. to 1 scr. purgative
Pilulae aloes et myrrhae	Pilulae aloes cum myrrha	Pilulae aloes cum myrrha	10 grs. to 1 scr. purg. tonic

EDINBURGH.	DUBLIN.	LONDON.	*Dose.*	*Nature.*
	Decoctum aloes comp.	Decoctum aloes compositum	½ oz. to 2 oz.	cathartic
Tinctura aloes socotorinae	Tinctura aloes	Tinctura aloes	½ dr. to 2 dr.	tonic
Tinctura aloes aetherea			½ dr. to 2 dr.	stim. cathartic
Tinctura aloes et myrrhae	Tinctura aloes composita	Tinctura aloes composita	½ dr. to 2 dr.	tonic
Vinum aloes socotorinae	Vinum aloes	Vinum aloes	½ oz. to 1 oz.	cathartic
Althaeae officinalis radix	Althaeae radix, folia	Althaeae radix, folia		emollient
Syrupus althaeae officinalis	Syrupus althaeae	Syrupus althaeae	1 dr. to 2 dr.	demulcent
Decoctum althaeae officinalis	Decoctum althaeae			demulcent
Alumen	Alumen	Alumen	10 grs. to 1 scr.	astringent
Alumen exsiccatum	Alumen ustum	Alumen exsiccatum	external,	astringent
Pulvis aluminis compositus			10 grs. to 1 scr.	astringent
		Liquor aluminis compositus	external	astringent
	Aluminis cataplasma			do.
Ammoniae aqua				pungent, diffusible
Aqua ammoniae diluta	Ammoniae causticae aqua	Liquor ammoniae	15 mins. to ½ dr.	stimulant, antacid
Oleum ammoniatum	Linimentum ammoniae	Linimentum ammoniae fortius	external,	stimulant
Subcarbonas ammoniae	Ammoniae carbonas	Ammoniae subcarbonas	5 grs. to 1 scr.	stim. antacid, emetic
Solutio subcarb. ammon.	Carbonatis ammoniae aqua	Liquor ammoniae subcarbonatis	½ dr. to 1 dr.	stim. antacid
		Linimentum ammon. subcarbon.	external	do.
	Ammoniae bicarbonas		5 grs. to 1 scr.	stim. antacid
Alcohol ammoniatum	Spiritus ammoniae	Spiritus ammoniae	½ dr. to 1 dr.	stim. antacid
Alcohol ammon. aromat.	Spiritus ammoniae aromaticus	Spiritus ammoniae aromaticus	do.	do.
Alcohol ammon. foetidum	Spiritus ammoniae foetidus	Spiritus ammoniae foetidus	½ dr. to 1 dr.	antispasmodic
		Spiritus ammoniae succinatus	10 mins. to 40,	antispasmodic
Aqua acetatis ammoniae	Ammoniae acetatis aqua	Liquor ammoniae acetatis	2 dr. to ½ oz.	diaphoretic
Murias ammoniae	Ammoniae murias	Ammoniae murias	10 grs. to ½ dr.	do. deobstruent
Hydrosulphuretum ammoniae	Ammoniae hydrosulphuretum		5 mins. to 10,	sedative
Ammoniacum gummi resina	Ammoniacum	Ammoniacum	10 grs. to ½ dr.	expectorant
	Mistura ammoniaci	Mistura ammoniaci	½ oz. to 1 oz.	expectorant
Emplastrum ammoniaci	Emplast. ammoniaci	Emplastrum ammoniaci	external,	stimulant
	Emplast. ammoniaci cum hydrar.	Emplas. ammoniaci cum hydrarg.	do.	deobstruent

EDINBURGH.	DUBLIN.	LONDON.	Dose. Nature.
Amomi repentis semina	Amomum cardamomum.	Cardamomi semina	5 grs. to 1 scr. carminative
Tinctura amomi repentis		Tinctura cardamomi	1 dr. to 2 drs. carminative
	Tinctura cardamomi comp.	Tinctura cardamomi composita	do.
Amomi zingiberis radix	Amomum zingiber	Zingiberis radix	5 grs to 1 scr. carminative
Tinctura amomi zingiberis	Tinctura zingiberis	Tinctura zingiberis	1 dr. to 2 drs. carminative
Syrupus amomi zingiberis	Syrupus zingiberis	Syrupus zingiberis	do.
Amygdalae communis nuclei	Amygdalae dulces	Amygdalae dulces	demulcent.
	Amygdalae amarae	Amygdalae amarae	do. narcotic
Oleum amygdalae communis	Oleum amygdalarum	Oleum amygdalarum	½ oz. to 1 oz. demulcent
	Confectio amygdal.	Confectio amygdalarum	1 dr. to ½ oz. do.
Emulsio amygdalae communis	Mistura amygdalarum	Mistura amygdalarum	1 lb. to 2 lbs. daily
Amygdalus persica	Folia amygd. persicae		sedative
Amylum		Amylum	demulcent
Mucilago amyli	Mucilago amyli	Mucilago amyli	do. 4 oz. to 8, in clyster
Trochisci gummosi			1 dr. to 2 drs. demulcent
Amyridis Gileadensis resina			10 mins. to 20, stimulant
Amyridis elemiferae resina	Resina amyridis elemiferae	Elemi	stimulant, external
	Unguentum elemi	Unguentum elemi compositum	external, detergent
Anchusae tinctoriae radix			colouring
Anethi foeniculi semina	Semina foeniculi dulcis	Foeniculi semina	carminative
	Oleum foeniculi dulcis		2 mins. to 5, carminative
	Aqua foeniculi	Aqua foeniculi	1 dr. to 4, aromatic
Anethum graveolens		Anethi semina	carminative
		Aqua anethi	1 oz. to 4 oz. aromatic
Angelicae archangelicae radix	Angelicae arch. semina		carminative
Anthemidis nobilis flores	Chamaemelum	Anthemidis flores	1 scr. to 1 dr. tonic
Extractum anthemidis nobilis	Extractum chamaemeli	Extractum anthemidis	10 grs. to 1 scr. do.
Oleum anthemidis nobilis		Oleum anthemidis	2 mins. to 5, carminative
Infusum anthemidis nobilis	Infusum chamaemeli	Infusum anthemidis	½ oz. to 2 oz. tonic, bitter
Decoctum anthemidis nobilis	Decoctum chamaemeli compositum	Decoctum malvae compositum	clyster
Anthemidis pyrethri radix	Radix anthem. pyrethri	Pyrethri radix	1 scr. to ½ dr. pungent, sialagogue

EDINBURGH.	DUBLIN.	LONDON.	*Dose.*	*Nature.*
Antimonii sulphuretum	Antimonii sulphuretum	Antimonii sulphuretum	5 grs. to 2 scr.	diaphoretic
Sulph. antimonii praeparatum	Antimonii sulphuretum praeparat.		do.	do.
Sulph. antimonii praecipitatum	Sulphur antimoniatum fuscum	Antim. sulphuretum praecipitatum	1 gr. to 1 scr.	diaphoretic
Oxid. antim. cum phos. calcis	Pulvis antimonialis	Pulvis antimonialis	5 grs. to $\frac{1}{2}$ dr.	do.
	Antim. oxydum nitromuriaticum			chemical
		Antimonii vitrum		chemical
Tartras antimonii	Antimonii et potassae tartras	Antimonium tartarizatum	1 gr. to 5,	emetic, sedative
Vinum tartratis antimonii	Liquor tartari emetici	Vinum antimonii tartarizati	1 dr. to 2 drs.	emetic
	Unguent. tartari emetici			external
Aqua distillata	Aqua distillata	Aqua distillata		chemical, diluent
Arbutus uvae ursi folia	Folia arbuti uvae ursi	Uvae ursi folia	10 grs. to $\frac{1}{2}$ dr.	astringent
Arctii lappae radix, semina	Arctii lappae radix, folia		1 dr. to 2 drs.	astringent
Argentum	Argentum	Argentum		chemical
Nitras argenti	Argenti nitras fusum	Argenti nitras		external, caustic
	Argenti nitratis crystalli		$\frac{1}{2}$ gr. to 1 gr.	tonic
Aristolochiae serpentariae radix	Aristol. serpentaria	Serpentariae radix	10 grs. to $\frac{1}{2}$ dr.	stimul.
Tinct. aristolochiae serpentariae	Tinctura serpentariae	Tinctura serpentariae	1 dr. to 2 drs.	stimul.
Arnicae montanae flores, radix	Arnicae montanae flores, folia		5 grs. to 10,	stimul. narcot.
Aromaticum electuarium	Confectio aromatica	Confectio aromatica	1 scr. to 1 dr.	aromatic
	Emplastrum aromaticum			external
Aromaticus pulvis	Pulvis aromaticus	Pulvis cinnamomi compositus	5 grs. to 10,	aromatic
Arsenici oxidum	Arsenici oxydum album	Arsenicum album		external, caustic
	Arsen. oxyd. alb. sublim.	Arsenicum album sublimatum	$\frac{1}{8}$ gr. to $\frac{1}{4}$,	febrifuge
Solutio arsenicalis	Liquor arsenicalis	Liquor arsenicalis	5 mins. to 10,	febrifuge
Artem. absinth. fol. et summ. flor.	Art. abs. summit. flor.	Absinthium	1 scr. to 1 dr.	tonic
	Extractum artemis. absinthii		$\frac{1}{2}$ scr. to 1 scr.	tonic
Artemisiae santonicae cacumina	Semina artem. santonici		1 scr. to $\frac{1}{2}$ dr.	vermifuge
	Artemis. Chinens. folia			moxa
	Artem. Indicae folia			moxa
Asari Europaei folia	Asari Europaei folia	Asari folia	5 grs. to 10,	errhine

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Asari pulvis compositus	Pulvis asari compositus		5 grs. to 10, errhine
Astragalae tragacanthae gummi	Astrag. tragacanth. gummi	Tragacantha	10 grs. to 1 dr. demulc.
Mucil. astragalae tragacanthae	Mucilago gummi tragacanthae		1 dr. to 2 drs. demulc.
		Pulvis tragacanthae compositus	½ dr. to 1, do.
Aspidii filicis maris radix	Aspidium filix mas	Filicis radix	1 dr. to 2 drs. anthelm.
Atropae belladonnae folia	Folia atropae belladonna	Belladonnae folia	1 gr. to 5, narcotic
Suc. spiss. atropae belladonnae	Succus spissat. bellad.	Extractum belladonnae	½ gr. to 3 grs. narcotic
	Emplast. belladonnae		external
	Atrop. bellad. radix		1 gr. to 5, narcotic
Avenae sativae semina		Avenae semina	demulcent
Farina avenae sativae	Farina avenae sativae		do.
Barytae carbonas			chemical, poisonous
Murias barytae	Barytae murias		in solution
Solutio muriatis barytae	Barytae muriatis aqua		5 mins. to 10, tonic
Sulphas barytae	Barytae sulphas		chemical
Bismuthum	Bismuthum	Bismuthum	do.
	Bismuthi subnitras	Bismuthi subnitras	3 grs. to 5, tonic
Bitumen petroleum	Bitumen petroleum Barbadense	Petroleum	10 mins. to ½ dr. stimulant
Boletus igniarius			external
Bonplandiae trifoliatae cortex	Bonpl. trif. cortex	Cuspariae cortex	10 grs. to 1 dr. tonic, bitter
Tinctura bonplandiae trifoliatae	Tinctura angusturae		½ dr. to 1 dr. tonic
		Infusum cuspariae	½ oz. to 4 oz. tonic
Bubonis galbani gummi resina	Galbanum	Galbani gummi resina	10 grs. to 1 scr. antispasmodic
	Tinctura galbani		1 dr. to 2 drs. antispasmodic
	Pilulae galb. comp.	Pilulae galbani compositae	10 grs. to 1 scr. antispasmodic
Emplastrum gummosum	Emplastrum galbani	Emplastrum galbani compositum	external
Calx	Calx recens usta	Calx	chemical
		Calx e testis	do.
Aqua calcis	Aqua calcis	Liquor calcis	½ lb. to 1 lb. daily, antacid
Oleum lini cum calce	Linimentum calcis		external
Calcis carbonas			chemical

EDINBURGH.	DUBLIN.	LONDON.	Dose.	Nature.
a. mollior ; Creta alba	Creta alba	Creta		chemical
b. durior ; Marmor album	Marmor album	Marmor album		do.
c. ex testis ostrearum		Testae		do.
		Testae praeparatae	10 grs. to 1 dr.	antacid
Calcis carbonas praeparatus	Creta praeparata	Creta praeparata	do.	
	Calcis carbonas praecipitatum		do.	
Potio carbonatis calcis	Mistura cretae	Mistura cretae	1 oz. to 2,	antacid
Trochisci carbonatis calcis			1 dr. to 2,	antacid
Pulvis carbonatis calcis comp.	Pulvis cretae comp.	Pulvis cretae compositus	½ dr to 1,	do.
	Calcis murias	Calcis murias	chemical	
Solutio muriatis calcis	Calcis muriatis aqua	Liquor calcis muriatis	40 mins. to 1 dr.	tonic
	Calcis phosphas praecipit.		1 scr. to 1 dr.	tonic
Camphora	Camphora	Camphora	3 grs. to 10,	stimulant
Tinctura camphorae	Spiritus camphoratus	Spiritus camphorae	external	
Emulsio camphorae	Mistura camphorae	Mistura camphorae	½ oz. to 2,	stimulant
Oleum camphoratum	Oleum camphoratum	Linimentum camphorae	external	
	Linim. camphorae comp.	Linimentum camphoratum comp.	external	
	Mist. camph. cum magn.		½ oz. to. 2,	stimulant
Canellae albae cortex	Canella alba	Canellae cortex	10 grs. to ½ dr.	stimulant
Cantharis vesicatoria	Cantharis vesicatoria	Cantharis	½ gr. to 2,	stimulant, diuretic
Tinctura cantharidis vesicatoriae	Tinctura cantharidis	Tinctura cantharidis	10 mins. to 30,	diuretic
Unguent. pulv. canthar. vesicat.		Ceratum cantharidis	external	
Unguent. infusi canthar. vesicat.	Unguent. cantharidis	Unguentum cantharidis	do.	
Emplastrum cantharidis vesicat.	Emplastrum cantharidis	Emplastrum cantharidis	do.	
Emplast. canth. vesicat. comp.			do.	
Capsici annui fructus	Capsici annui capsulae	Capsici baccae	1 gr. to 5,	acrid
	Tinctura capsici	Tinctura capsici	½ dr. to 1 dr. in gargles,	acrid
Carbo ligni	Carbo ligni	Carbo ligni	2 drs. to ½ oz.	antiseptic, febrifuge
	Emplast. carb. ligni		external,	antiseptic
Cardamines pratensis flores	Cardamines prat. flor.	Cardamines flores	1 scr. to 1 dr.	antispas. ? antiscor.

EDINBURGH.	DUBLIN.	LONDON.	*Dose.*	*Nature.*
Cari carui semina	Carui semina	Carui semina	1 dr. to 2 drs.	carminative
Spiritus cari carui	Spiritus carui	Spiritus carui	1 dr. to ½ oz.	do.
	Oleum essentiale carui	Oleum carui	3 gtts. to 5,	do.
		Aqua carui	2 oz. to 4 oz.	aromatic
Cassiae fistulae fructus	Cassiae fistularis legumen	Cassiae pulpa	in composition	
Electuarium cassiae fistulae	Electuarium cassiae	Confectio cassiae	1 dr. to 4 drs.	lenitive
Cassiae sennae folia	Cassiae sennae folia	Sennae folia	1 scr. to 1 dr.	purgative
Tinctura sennae composita	Tinctura sennae comp.	Tinctura sennae	½ oz. to 1 oz.	do.
Electuarium cassiae sennae	Electuarium sennae	Confectio sennae	½ dr. to ½ oz.	cathartic
Syrupus cassiae sennae		Syrupus sennae	2 drs. to 4 drs.	laxative
	Infusum sennae comp.	Infusum sennae compositum	1 oz. to 2 oz.	cathartic
Infusum sennae comp.	Inf. sennae cum tamarindis		1 oz. to 2 oz.	do.
		Pulvis sennae compositus	1 scr. to 2 scrs.	do.
Castor fiber; Castoreum	Castoreum	Castoreum	10 grs. to 1 scr.	antispasmodic
Tinctura castorei	Tinctura castorei Rossici	Tinctura castorei	½ dr. to 1 dr.	do.
Tinctura castorei composita			do.	do.
Cataplasma	Pulvis pro cataplasmate		external	
	Cataplasma simplex		do.	
Centaureae benedictae herba	Cnicus benedictus		1 dr. to 2 drs. in infusion,	bitter
Cera alba	Cera alba	Cera alba	external	
Linimentum simplex			do.	
Unguentum simplex	Unguentum cerae albae		do.	
Cera flava	Cera flava	Cera flava	do.	
Ceratum simplex	Unguentum cerae flavae	Ceratum simplex	do.	
Emplastrum simplex		Emplastrum cerae	do.	
Cerevisiae fermentum	Cerevisiae fermentum	Cerevisiae fermentum	1 oz. to 2 oz.	antiseptic
	Catapl. ferment. cerev.	Cataplasma fermenti	external, do.	
Chironiae centaurii summitates	Erythraea centaureum	Centaurii cacumina	1 scr. to 1 dr.	bitter, tonic
Chlorinium	Chlorinii aqua		½ oz. to 1 oz.	antiseptic
Cinchonae lancifoliae cortex	Cinchona officinalis	Cinchonae lancifoliae cortex	10 grs. to 1 dr.	tonic, febrifuge
Cinchonae cordifoliae cortex	Cinchona flava	Cinchonae cordifoliae cortex	do.	

EDINBURGH.	DUBLIN.	LONDON.	*Dose.* *Nature.*
Cinchonae oblongifoliae cortex	Cinchona rubra	Cinchonae oblongifoliae cortex	10 grs. to 1 dr. tonic, febrifuge
Decoctum cinchonae lancifoliae	Decoctum cinchonae	Decoctum cinchonae	1 oz. to 4 oz. tonic
	Extractum cinchonae	Extractum cinchonae	5 grs. to ½ dr. tonic
Extractum cinchonae lancifoliae		Extractum cinchonae resinosum	do. do.
Infusum cinchonae lancifoliae	Infusum cinchonae	Infusum cinchonae	1 oz. to 4 oz. tonic
Tinctura cinchonae lancifoliae	Tinctura cinchonae	Tinctura cinchonae	1 dr. to 2 drs. do.
Tinctura cinchonae composita	Tinctura cinchonae composita	Tinctura cinchonae composita	do. do.
		Tinctura cinchonae ammoniata	do. do.
	Quininae sulphas		1 gr. to 10 grs. dose, or 1 scr. daily, tonic
Citri aurantii succus cort.	Citri aurantii fructus, flores	Aurantii baccae, cortex	juice subacid ; rind aromatic, petals frag.
Aqua citri aurantii			1 oz. to 2 oz. aromat.
	Infus. aurant. comp.	Infusum aurantii compositum	1 oz. to 2 oz. bitter, aromatic
Conserva citri aurantii	Conserva aurantii	Confectio aurantiorum	1 dr. to 1 oz. do. do.
	Tinctura aurantii	Tinctura aurantii	1 dr. to 2 drs. do. do.
Syrupus citri aurantii	Syrupus aurantii	Syrupus aurantiorum	1 dr. to 2 drs. do. do.
Citri medicae fructus	Limones	Limones	juice acid ; rind bitter
Oleum volatile citri medicae	Citri med. oleum vol.	Limonum oleum	2 mins. to 5, aromatic
Aqua citri medicae			1 oz. to 2 oz. fragrant
Syrupus citri medicae	Syrupus limonis	Syrupus limonum	2 drs. to 4 drs. subacid
Coccus cacti	Coccus cacti	Coccus	colouring
Cochleariae armoraciae radix	Cochl. armor. rad.	Armoraciae radix	acrid, antiscorbutic
	Spiritus armor. comp.	Spiritus armoraciae compositus	1 dr. to 1 oz. stimulant
	Infus. armor. comp.	Infusum armoraciae compositum	1 oz. to 4 oz. do.
Cochlearia officinalis	Cochlear. off. herba		antiscorbutic, acrid, bitter
Coci butyraceae oleum fixum			external, emollient
Colchici autumnalis radix	Colchici autum. bulbus	Colchici radix	1 gr. to 5, diuretic, anodyne
	Colchici autumn. semina		do. do.
Syrupus colchici autumnalis			do. do.
	Acetum colchici	Acetum colchici	½ dr. to 2 drs. sedative
	Oxymel colchici		½ dr. to 2 drs. do.
		Spiritus colchici ammoniatus	½ dr. to 2 drs. do.

EDINBURGH.	DUBLIN.	LONDON.	*Dose.*	*Nature.*
		Vinum colchici	½ dr. to 2 drs.	sedative
	Tinct. semin. colchici		½ dr. to 2 drs.	do.
Colombae radix	Colombae radix	Calumba	1 scr. to 1 dr.	bitter, tonic
Infusum colombae	Inf. colombae	Infusum calumbae	1 oz. to 4 oz.	tonic
Tinctura colombae	Tinctura colombae	Tinctura calumbae	1 dr. to 2 drs.	do.
Conii maculati folia	Conium maculatum	Conii folia	1 gr. to 5,	sedative
		Conii semina	do.	do.
Succus spissatus conii maculati	Succus spissatus conii	Extractum conii	do.	do.
Tinctura conii maculati	Tinctura conii		½ dr. to 1 dr.	sedative
	Unguent. conii		external,	anodyne
	Emplast. conii		do.	do.
Convolvuli scam. gummi resina	Convol. scammon. gum. res.	Scammoniae gummi resina	5 grs. to 15,	cathartic
Pulvis scammoniae compositus	Pulvis scammon. comp.	Pulvis scammoniae compositus	1 scr. to 2,	do.
	Electuarium scammonii	Confectio scammoneae	1 scr. to 1 dr.	do.
Convolvuli jalapae radix	Conv. jalap. radix	Jalapae radix	10 grs. to 1 scr.	do.
Extractum convolvuli jalapae	Extractum jalapae	Extractum jalapae	5 grs. to 10,	do.
Tinctura convolvuli jalapae	Tinctura jalapae	Tinctura jalapae	1 dr. to ½ oz.	do.
Pulvis jalapae compositus	Pulvis jalap. comp.		½ dr. to 1 dr.	do.
Copaiferae officinalis resina	Cop. off. resina liquida	Copaiba	15 mins. to 40,	diuretic, tonic
Coriandri sativi semina	Coriandri sativi semina	Coriandri semina	10 grs. to ½ dr.	carminative
Cornu cervae elaphi	Cornu cervina, ramenta	Cornua	in composition	
	Pulvis cornu cervini usti	Cornua ustum	½ dr. to 1 dr.	inert
		Mistura cornu usti	2 oz. to 4 oz.	demulcent
Croci sativi stigmata	Croci sativi stigmata	Croci stigmata		colouring
		Syrupus croci	1 dr. to 2,	anodyne
Tinctura croci	Tinctura croci		1 dr. to 2,	stimulant
Crotonis eleutheriae cortex	Croton cascarilla	Carcarillae cortex	1 scr. to 1 dr.	stimulant
Tinctura crotonis eleutheriae	Tinctura cascarillae	Tinctura cascarillae	1 dr. to 2,	do.
	Infusum cascarillae	Infusum cascarillae	1 oz. to 4,	do.
Croton tiglium	Oleum crotonis tiglii	Tiglii oleum	1 gtt. to 2,	purgative
Cucumeris colocynthidis pulpa	Fructus cucum. colocynth.	Colocynthidis pulpa	5 grs. to 10,	do.

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
	Extract. colocynth. simplex	Extractum colocynthidis	10 grs. to ½ dr. purgative
	Extractum colocynthidis comp.	Extractum colocynthidis comp.	do. do.
Pilulae colocynthidis compositae	Pilulae colocynthidis compositae		5 grs. to 15, do.
Cuminum cyminum		Cumini semina	5 grs. to 10, carminative
		Emplastrum cumini	do. do.
Cuprum	Cuprum		chemical
Cupri subacetas	Cupri subacetas	Ærugo	external, corrosive
	Cupri subacet. praeparatum		do. do.
	Oxymel cupri subacet.	Linimentum aeruginis	do. do.
Unguentum subacetatis cupri	Unguentum cupr. subac.		do. do.
	Cupri acetas		do. do.
Ammoniaretum cupri	Cuprum ammoniatum	Cuprum ammoniatum	1 gr. to 3, tonic
Pilulae ammoniareti cupri			5 grs. to 15, do.
	Cupri ammoniati aqua	Liquor cupri ammoniati	external, stimulant
Sulphas cupri	Cupri sulphas	Cupri sulphas	5 grs. emetic, external escharotic
Solutio sulphatis cupri composita			external, stimulant
Curcuma longa	Curcumae longae radix		colouring
Daphnes mezerei cortex	Cortex daphnes mezerei	Mezerei cortex	acrid
Decoctum daphnes mezerei	Decoctum mezerei		1 oz. to 2, acrid, anti-syphilitic
Daturae stramoniae herba	Stramonii datura folia	Stramonii folia	½ dr. to 1 dr. smoke anodyne
	Extract. stramonii	Extractum stramonii	1 gr. to 5, anodyne
	Datura stram. semin.	Stramonii semina	1 gr. to 5, do.
Dauci carotae radix	Dauci carotae radix	Dauci radix	emollient
	Dauci cataplasma		external, emollient
	Dauci sylvestris semina	Dauci semina	1 scr. to 1 dr. carminative
Delphinii staphisagriae semina	Semina delph. staphisagriae	Staphisagriae semina	5 grs. to 10, narcotic
Dianthi caryophylli flores	Flor. dianth. caryophylli		colouring
Syrupus dianthi caryophylli			demulcent
Digitalis purpureae folia	Folia digitalis	Digitalis folia	1 gr. to 5, sedative
		Digitalis semina	do. do.
Tinctura digitalis purpureae	Tinctura digitalis	Tinctura digitalis	10 gtts. to 20, sedative

EDINBURGH.	DUBLIN.	LONDON.	*Dose.* *Nature.*
Infusum digitalis purpureae	Infusum digitalis	Infusum digitalis	½ oz. to 2 oz. diuretic
Diosma crenata	Diosmae crenatae folia		1 scr. to ½ dr. tonic
	Infusum Buchu		2 oz. to 4, tonic, diuretic
	Tinctura Buchu		1 dr. to 2, do.
Dolichi prurientis pubes	Dolichos prurien.	Dolichi pubes	5 grs. to 10, anthelmintic
Dorsteniae contrajervae radix		Contrajervae radix	10 grs. to ½ dr. tonic
		Pulvis contrajervae comp.	1 scr. to 2, do.
Dryabalanops camphora	Camphora		not in use
Enema	Enema catharticum		external, purgative
Eugeniae caryophyllatae flores	Eugenia caryoph. caryoph. arom.	Caryophylli	acrid, carminative
Oleum volatile eugen. caryoph.	Oleum volat. caryoph. aromat.	Caryophyllorum oleum	2 mins. to 5, do. do.
	Infusum caryophyl.	Infusum caryophyllorum	1 oz. to 4, aromatic
Euphorbia officinalis	Euphorb. Canar. gum. res.	Euphorbiae gummi resina	1 gr. purgative, acrid
Ferri fila	Ferri fila	Ferrum	chemical
Limatura ferri	Scobs ferri		3 grs. to 10, tonic
Limatura ferri purificata			do. do.
Oxidum ferri nigrum	Squamae oxidi ferri		do. do.
Oxidum ferri nigrum purificat.	Ferri oxydum nigrum		do. do.
Carbonas ferri praecipitatus	Ferri carbonas	Ferri subcarbonas	1 gr. to 1 scr. tonic, anodyne
Subcarbonas ferri praeparatus	Ferri rubigo		do. do.
Sulphas ferri	Ferri sulphas	Ferri sulphas	1 gr. to 5, tonic
Sulphas ferri exsiccatus			chemical
Pilulae sulphatis ferri comp.			10 grs. to 20, tonic
	Mistura ferri comp.	Mistura ferri composita	1 oz. to 2, tonic
	Pilulae ferri comp.	Pilulae ferri compositae	10 grs. to 20, tonic
Oxidum ferri rubrum	Ferri oxydum rubrum		3 grs. to 10, tonic
Emplastrum oxidi ferri rubri	Emplastrum thuris		external
Tinctura muriatis ferri	Liquor muriatis ferri	Tinctura ferri muriatis	10 mins. to 20, diuretic
Murias ammoniae et ferri		Ferrum ammoniatum	3 grs. to 10, deobstruent
		Tinctura ferri ammoniati	10 mins. to 30, do
	Mistura ferri aromat.		1 oz. to 2, tonic

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Tartras potassae et ferri	Ferri tartarum	Ferrum tartarizatum	5 grs. to 10, tonic
		Vinum ferri	1 dr. to $\frac{1}{2}$ oz. tonic
	Ferri acetas		10 mins. to 20, tonic
	Tinctura ferri acetatis		$\frac{1}{2}$ dr. to 1 dr. tonic
	Tinctura acetatis ferri cum alcohol		do.
Sulphuretum ferri	Ferri sulphuretum		chemical
		Liquor ferri alkalini	1 dr. to 1 oz. tonic
	Ferri cyanuretum		chemical
Ferulae assae foetidae gummi resina	Assafoetida	Assafoetidae gummi resina	10 grs. to 20, antispasmodic
	Mistura assae foetidae	Mistura assafoetidae	$\frac{1}{2}$ dr. to 1 dr. do.
Tinctura ferulae assae foetidae	Tinctura assae foetidae	Tinctura assafoetidae	$\frac{1}{2}$ dr. to 1 dr. do.
	Enema foetidum		external, antispasmodic
Pilulae ferulae assae foetid. com.	Pilulae galbani comp.	Pil. galbani comp.	10 grs. to 20, antispasmodic
Emplast. ferulae assae foetidae			external, do.
Ficus caricae fructus	Fici caricae fructus siccat.	Caricae fructus	demulcent
Fucus vesiculosus	Fucus vesiculosus	Fucus	antistrumous
Gallae	Gallae quercus infectoriae	Gallae	5 grs. to 10, astringent
Tinctura gallarum	Tinctura gallarum		$\frac{1}{2}$ dr. to 1 dr., astringent
	Unguent. gallarum		external, astringent
Gambogiae gummi resina	Stalagmitis gambogia	Cambogia	2 grs. to 10, cathartic
Pilulae gambogiae compositae	Pilulae gambogiae comp.	Pilulae cambogiae compositae	5 grs. to 10, do.
Gentianae luteae radix	Gentianae luteae radix	Gentianae radix	10 grs. to $\frac{1}{2}$ dr. bitter, tonic
Extractum gentianae	Extractum gentianae	Extractum gentianae	10 grs. to 1 scr. do. do.
Infusum gentianae compositum	Iufusum gentianae compositum	Infusum gentianae compositum	1 oz. to 2, do.
Tinctura gentianae composita	Tinctura gentianae composita	Tinctura gentianae composita	1 dr. to 2, stomachic
Vinum gentianae compositum			$\frac{1}{2}$ oz. to 1, do.
Geoffraeae inermis cortex	Geoffraeae inermis cortex		decoction
Decoctum geoffraeae inermis	Decoctum Geoffraeae		1 oz. anthelmintic
Geum urbanum	Gei urbani radix		1 scr. to 2, astringent
Glycyrrhizae glabrae radix	Glycyrrhizae glabrae radix	Glycyrrhizae radix	demulcent
Extractum glycyrrhizae glabrae	Extractum glycyrrhizae	Extractum glycyrrhizae	$\frac{1}{2}$ dr. to 1, demulcent

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Trochisci glycyrrhizae glabrae			½ dr. to 1, demulcent
Trochisci glyc. glabrae cum opio			do. anodyne
	Decoctum glycyrrhizae		demulcent
Gratiolae officinalis herba			10 grs. to 20, purgative
Guaiaci officinalis lignum	Guaiacum officinale	Guaiaci lignum	decoction
Resina guaiaci officinalis	Resina guaiaci officinalis	Guaiaci resina	10 grs. to 20, sudorific
Tinctura guaiaci officinalis	Tinctura guaiaci	Tinctura guaiaci	1 dr. to 2, do.
Tinc. guaiaci officinalis ammon.	Tinctura guaiaci ammoniata	Tinctura guaiaci ammoniata	do. do.
Decoctum guaiaci compositum	Decoctum guaiaci compositum		2 oz. to 4, do.
	Aqua calcis composita		do. do.
		Mistura guaiaci	1 oz. to 2, do.
Haematoxyli campechiani lignum	Haematoxylum campech.	Haematoxyli lignum	decoction
	Decoctum haematox.		2 oz. to 4, astringent
Extract. haematoxyli campech.	Extractum haematoxyli	Extractum haematoxyli	10 grs. to 20, do.
Hellebori nigri radix	Helleborus niger	Hellebori nigri radix	10 grs. to ½ dr. cathartic, sedative
Extractum helleboris nigri			4 grs. to 10, do.
Tinctura helleboris nigri	Tinctura hellebori nigri	Tinctura hellebori nigri	½ dr. to 1, emmenagogue
Helleborus foetidus		Hellebori foetidi folia	emmenagogue
Hirudo medicinalis	Hirudo medicinalis		external
Hordei distichi semina	Hordeum distichum, semina	Hordei semina	demulcent
Decoctum hordei	Decoctum hordei	Decoctum hordei	do.
	Decoctum hordei compositum	Decoctum hordei compositum	do.
Humuli lupuli strobili	Humuli strobili	Humuli strobili	sedative, bitter
	Extractum humuli	Extractum humuli	5 grs. to 20, sedative
Tinctura humuli lupuli	Tinctura humuli	Tinctura humuli	30 gtts. to 60, do.
Hydrargyrus	Hydrargyrum	Hydrargyrum	chemical
Hydrargyrus purificatus	Hydrargyrum purificatum	Hydrargyrum purificatum	½ oz. to 4, purgative
Pilulae hydrargyri	Pilulae hydrargyri	Pilulae hydrargyri	5 grs. to 15, alterative, purgative
Emplastrum hydrargyri		Emplastrum hydrargyri	external
	Emplast. ammon. cum hydrarg.		do.
Unguentum hydrargyri	Unguentum hydrargyri	Unguentum hydrargyri fortius	do.

EDINBURGH.	DUBLIN.	LONDON.	*Dose.* *Nature.*
	Unguentum hydrargyri mitius	Unguentum hydrargyri mitius	external
		Linimentum hydrargyri	do.
	Hydrargyrum cum magnesia		5 grs. to 20, alterative
	Hydrargyrum cum creta	Hydrargyrum cum creta	do. do.
Acetas hydrargyri	Acetas hydrargyri		1 gr. to 5, specific
Murias hydrargyri corrosivus	Hydrargyri murias corrosivum	Hydrargyri oxymurias	$\frac{1}{8}$ gr. to $\frac{1}{2}$ gr. specific
		Liquor hydrargyri oxymuriatis	1 dr. to 2 drs. do.
Submurias hydrargyri mitis	Calomelas sublimatum	Hydrargyri submurias	1 gr. to 2, alterat. 5 to 20, purg.
Pilulae subm. hydrar. comp.	Pilulae calom. comp.	Pilulae hydrar. submuriatis comp.	5 grs. to 20, purgative
Submurias hydrar. praecip.	Calomelas praecipitatum		5 grs. to 20, purgative
	Hydrar. submurias ammoniatum	Hydrarg. praecipitatum album	1 gr. to 5, alterative
	Unguent. submuriatis hydrargyri	Unguent. hydrar. praecipitati albi	external
Oxidum hydrargyri cinereum	Hydrargyri oxidum nigrum	Hydrargyri oxidum cinereum	1 gr. to 5, alterative
Unguent. oxidi hydrarg. ciner.			
	Hydrargyri oxidum rubrum	Hydrargyri oxidum rubrum	external
Oxid. hyd. rub. per acid. nitric.	Hydrargyri oxidum nitricum	Hydrargyri nitrico-oxidum	external
Unguent. oxidi hydrargyri rubri	Unguent. hydrar. oxidi nitrici	Unguent. hydrargyri nitrico-oxidi	do.
Unguent. nit. hydrarg. fortius	Unguent. nitratis hydrargyri	Unguentum hydrargyri nitratis	do.
Unguent. nitr. hydrar. mitius			do.
	Hydrargyri persulphas		chemical
Subsulphas hydrargyri flavus	Hydrargyri oxidum sulphuricum		1 gr. to 5, emetic
Sulphuretum hydrarg. nigrum	Hydrargyri sulphuretum nigrum	Hydrargyri sulphuretum nigrum	1 scr. to 2, alterative
Hydrargyri sulphuretum rub.	Hydrargyri sulphuretum rubrum	Hydrargyri sulphuretum rubrum	10 grs. to 20, fumigation
	Hydrargyri cyanuretum		chemical
Hyosciami nigri herba	Hyosciamus niger	Hyosciami folia	nauseous, sedative
Semina hyosciami nigri et opii		Hyosciami semina	do.
Suc. spissatus hyosciami nigri	Succus spissatus hyosciami	Extractum hyosciami	5 grs. to 1 scr. anodyne
Tinctura hyosciami nigri	Tinctura hyosciami	Tinctura hyosciami	20 gtts. to $\frac{1}{2}$ dr. do.
Hyssopus officinalis herba			in tea, pectoral
Inula helenium	Inula helenium	Helenium	1 scr. to 2, diaphoretic
Iodinium	Iodinium		chemical

EDINBURGH.	DUBLIN.	LONDON.	*Dose.* *Nature.*
	Iodinii tinctura		10 gtts. to 30, antistrumous
	Unguentum iodinii		external
Ipecacuanha ; radix	Ipecacuanha ; radix	Ipecacuanhae radix	1 gr. expect. 5 sudorific, 20 emetic
Pulvis ipecacuanhae et opii	Pulvis ipecacuanhae compositus	Pulvis ipecacuanhae compositus	10 grs. to 20, sudorific
Vinum ipecacuanhae	Vinum ipecacuanhae	Vinum ipecacuanhae	10 mins. to 40, expect. ½ oz. emetic
Iridis Florentinae radix			fragrant
Juniperi communis baccae	Juniperi communis baccae	Juniperi baccae	in tea, diuretic
	Cacumina junip. communis	Juniperi cacumina	in infusion, do.
Spiritus juniperi compositus	Spiritus juniperi compositus	Spiritus juniperi compositus	½ oz. to 1 oz. diuretic
Oleum volatile juniperi comm.	Oleum juniperi	Oleum juniperi	5 gtts to 10, do.
Juniperi lyciae gummi resina	Olibanum ; Boswellia serrata	Olibanum	masticatory
Juniperi sabinae folia	Juniperus sabina	Sabinae folia	acrid, cathartic
Oleum volatile juniperi sabinae	Oleum essentiale sabinae		5 mins. to 10, emmenagogue
Ceratum juniperi sabinae	Unguentum sabinae	Ceratum sabinae	external
Kino	Kino	Kino ; Pterocarp. erinacea	10 grs. to 20, astringent
Tinctura kino	Tinctura kino	Tinctura kino	½ dr. to 1 dr. do.
	Pulvis kino compositus	Pulvis kino compositus	10 grs. to 20, do.
Krameria triandria	Radix krameriae triandriae	Krameriae radix	astringent
	Extractum krameriae triandriae		10 grs. to 20, do.
Lactucae virosae herba	Lactuca sativa		anodyne
Succus spissatus lactucae virosae			3 grs. to 5, diuretic
Lactucae sativae herba		Lactuca sativa	demulcent, hypnotic
Succus spissatus lactucae sativae		Extractum lactucae	3 grs. to 5, diuretic
Lactucarium			3 grs to 5, anodyne
Lavandulae spicae flores	Flores lavandulae spicae	Lavandulae flores	fragrant
Spiritus lavandulae spicae	Spiritus lavandulae	Spiritus lavandulae	external, stimulant
Spiritus lavandulae compositus	Spiritus lavandulae compositus	Spiritus lavandulae compositus	20 gtts. to 1 dr. stimulant
Oleum volat. lavandulae spicae	Oleum lavandulae	Oleum lavandulae	2 mins. to 5, aromatic, stimulant
Lauri cassiae cortex	Cortex lauri cassiae		5 grs. to 1 scr. astringent, aromat.
Aqua lauri cassiae			1 oz. to 2, aromatic
Flores lauri cassiae			5 grs. to 1 scr. stimulant, aromatic

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Lauri cinnamomi cortex	Cortex lauri cinnamomi	Cinnamomi cortex	5 grs. to 1 scr. aromatic, pungent
Aqua lauri cinnamomi	Aqua cinnamomi	Aqua cinnamomi	1 oz. to 2, aromatic, warm
	Oleum lauri cinnam.	Cinnamomi oleum	2 mins. to 5, acrid, aromatic
Spiritus lauri cinnamomi	Spiritus cinnamomi	Spiritus cinnamomi	$\frac{1}{2}$ dr. to 1 dr. aromatic
Tinctura lauri cinnamomi	Tinctura cinnamomi	Tinctura cinnamomi	1 dr. to 2, stimulant
Tinctura cinnamomi comp.		Tinctura cinnamomi composita	$\frac{1}{2}$ dr. to 2, stimulant
Lauri nobilis bacca	Baccae lauri nobilis	Lauri baccae	in composition
	Folia lauri nobilis	Lauri folia	aromatic
Oleum expressum lauri nobilis			external
Lauri camph. camphora	Lauri camph. camphora		*See* Camphora
Lauri sassafras lignum	Laurus sassafras ligni	Sassafras lignum	1 scr. to 1 dr. aromatic
Radix lauri sassafras	Radix lauri sassafras	Sassafras radix	do. do.
Oleum volatile lauri sassafras	Oleum sassafras		2 mins. to 10, aromatic
Leontodi taraxaci radix	Leontodon taraxacum radix	Taraxaci radix	bitter decoction
Herba leontodi taraxaci	Leontodon taraxacum herba	Taraxaci herba	do.
	Decoctum taraxaci		2 oz. to 4, bitter, diuretic
	Extractum taraxaci	Extractum taraxaci	10 grs. to 1 dr. do.
Lichen Islandicus	Cetraria Islandica	Lichen	bitter, demulcent
Decoctum lichenis Islandici	Decoctum lichenis Islandici	Decoctum lichenis	1 oz. to 2, do.
Lini usitatissimi semina	Lini usitatissimi semina	Lini usitatissimi semina	mucilaginous, oily
Oleum lini usitatissimi	Oleum lini	Oleum lini	externally, and in composition
Infusum lini usitatissimi	Infusum lini comp.	Infusum lini compositum	demulcent, 1 oz. to 4
Linum catharticum		Linum catharticum	1 dr. to 2, in infusion, purgative
Lythrum salicaria	Lythri salicaria herba		mucilaginous, astringent
Magnesia	Magnesia	Magnesia	10 grs. to 20, antacid, cathartic
Magnesiae carbonas	Magnesiae carbonas	Magnesiae subcarbonas	10 grs. to $\frac{1}{2}$ dr. antacid, cathartic
Sulphas magnesiae	Magnesiae sulphas	Magnesiae sulphas	2 drs. to 1 oz. purgative
	Magnesiae sulphas purum		do. do.
Malvae sylvestris herba		Malva	emollient, demulcent
Flores malvae sylvestris			do. colouring
Manganesium	Manganesii oxydum		chemical

EDINBURGH.	DUBLIN.	LONDON.	*Dose.*	*Nature.*
Manna	Manna	Manna	2 drs. to 1 oz.	sweet, laxative
Marrubii vulgaris herba	Marrubium vulgare	Marrubium		astringent
Mel	Mel	Mel		demulcent, composition
Mel despumatum	Mel despumatum	Mel despumatum		do.
Oxymel	Oxymel	Oxymel simplex		demulcent, expectorant
Melaleucae leucadendri oleum vol.	Oleum cajeput, melal. leucad.	Cajuputi oleum	3 mins. to 5,	stimulant, external
Melissae officinalis folia	Melissa officinalis			fragrant, in tea
Menispermi cocculi baccae	Cocculi suberosi fructus			narcotic, in ointment
Menthae piperitae herba	Mentha piperitis	Mentha piperita		fragrant, in tea
Aqua menthae piperitae	Aqua menthae piperitidis	Aqua menthae piperitae	1 oz. to 2,	carminative
Spiritus menthae piperitae	Spiritus menthae piperit.	Spiritus menthae piperitae	½ dr. to 1 dr.	carminative, stimulant
Oleum volatile menthae piperitae	Oleum menthae piperitidis	Oleum menthae piperitae	1 min. to 5,	do. do.
Menthae pulegii herba	Mentha pulegium	Pulegium		fragrant, in tea
Aqua menthae pulegii	Aqua pulegii	Aqua pulegii	1 oz. to 2,	expectorant
	Oleum pulegii	Oleum pulegii	2 mins. to 5,	stimulant
	Spiritus menthae pulegii	Spiritus pulegii	½ oz to 1,	do.
Mentha viridis	Mentha viridis	Mentha viridis		fragrant
	Oleum menthae viridis	Oleum menthae viridis	2 mins. to 5,	stimulant
	Aqua menthae viridis	Aqua menthae viridis	1 oz. to 2,	do.
	Spiritus menthae viridis		½ oz. to 1,	do.
	Infusum menthae simplex			fragrant
	Infusum menthae compositum			do
Menyanthis trifoliatae folia	Menyanthes trifoliata	Menyanthes		bitter, drastic
Momordica elaterium	Folia momord. elaterii		3 grs. to 5,	purgative
	Fructus momord. elat.	Elaterii pepones		preparation
Elaterium, succus spissatus	Elaterium ; fæcula	Extractum elaterii	½ gr. to 1 gr.	drastic, purgative
Morus nigra	Baccae mori nigrae	Mori baccae		subacid
		Syrupus mori		demulcent
Moschus ; Moschus moschif.	Moschus	Moschus	5 grs. to 10,	antispasmodic
	Tinctura moschi		1 dr. to 2,	do.
		Mistura moschi	½ oz. to 1,	do.

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Myristicae moschatae nucleus	Nucis moschatae nucleus	Myristicae nuclei	fragrant
Spiritus myristicae moschatae	Spiritus nucis moschatae	Spiritus myristicae	½ oz. to 1, stimulant, aromatic
	Oleum vol. nucis moschatae		2 mins. to 5, fragrant
Macis	Macis		5 grs. to 10, fragrant, stimulant
Myroxyli Peruiferi balsamum	Balsamum Peruiferi myroxyli	Balsamum Peruvianum	10 gtts. to 20, stimulant
Myrrha, gummi resina	Myrrha	Myrrha	10 grs. to ½ dr. do.
Tinctura myrrhae	Tinctura myrrhae	Tinctura myrrhae	1 dr. to 2, do.
Myrti pimentae fructus	Myrtus pimenta fructus	Pimentae baccae	10 grs. to 20, hot, aromatic
Aqua myrti pimentae	Aqua pimentae	Aqua pimentae	1 oz. to 4, stimulant
Spiritus myrti pimentae	Spiritus pimentae	Spiritus pimentae	1 dr. to 2, stimulant
Oleum volatile myrti pimentae	Oleum essentiale pimentae	Oleum pimentae	2 mins. to 5, acrid, stimulant
Nicotianae tabaci folia	Folia nicotianae tabaci	Tabaci folia	1 gr. to 5, errhine, ½ dr. in clyster
Vinum nicotianae tabaci			20 mins. to 60, diuretic
	Infusum tabaci	Infusum tabaci	½ lb. in clyster
Oleae Europaeae oleum fixum	Oleum olivae	Olivae oleum	2 oz. to 4, laxative
Opium	Opium Turcicum	Opium molle	½ gr. to 2, sedative
		Opium durum	do.
	Extractum opii aquosum	Extractum opii	do.
Pulvis opiatus		Pulvis cretae comp. cum opio	5 grs. to 20, do.
		Pulvis cornu cervi cum opio	do. do.
Pilula opiata	Pilulae saponis cum opio	Pilulae saponis cum opio	5 grs. to 20, do.
	Pilulae e styrace		5 gr. to 10, sedative
Electuarium opiatum	Confectio opii	Confectio opii	½ dr. to 1, anodyne, astringent
Emplastrum opii	Emplastrum opii	Emplastrum opii	external, anodyne
Tinctura opii	Tinctura opii	Tinctura opii	20 gtts. to 60, anodyne
Tinctura opii ammoniata			½ dr. to 1 dr. anodyne
Tinctura opii camphorata	Tinctura opii camphorata	Tinctura camphorae composita	4 dr. to ½ oz. do.
Tinctura saponis et opii	Linimentum saponis cum opio		external, anodyne
Vinum opii	Vinum opii	Vinum opii	20 mins. to 60, anodyne
	Acetum opii		15 mins. to 50, anodyne
	Enema opii		anodyne

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Origani majoranae herba	Origanum majorana		fragrant
Oleum origani majoranae			2 gtt. to 5, acrid, external
Origanum vulgare	Origanum vulgare	Origanum	fragrant, hot
	Oleum origani	Oleum origani	2 gtt. to 5, acrid, external
Ossa	Ossa		chemical
	Ossa cremata		do.
Ovum		Ovum	nutritious, demulcent
Oxalis acetosella		Acetosella	acid, refrigerant
Papaveris somniferi capsulae	Papaveris somniferae capsulae	Papaveris capsulae	demulcent, anodyne
Extractum papaveris somniferi		Extractum papaveris	1 gr. to 10, anodyne
Syrupus papaveris somniferi	Syrupus papaveris somnif.	Syrupus papaveris	½ oz. to 2, demulcent, anodyne
	Decoctum papaveris	Decoctum papaveris	external, anodyne
Papaver rhoeas	Papaver rhoeas petala	Rhoeados petala	colouring
	Syrupus papaveris rhoeadis	Syrupus rhoeados	1 dr. to 2, demulcent
Pastinacoe opoponacis gummi resina	Pastinac. opop. gummi res.	Opoponacis gummi resina	5 grs. to 10, foetid gum resin
Pimpinellae anisi semina	Pimpin. anis. semina	Anisi semina	10 grs. to 20, carminative
Oleum volatile pimpinellae anisi	Oleum anisi	Oleum anisi	5 mins. to 10, carminative
	Spiritus anisi comp.	Spiritus anisi	1 dr. to 2, do.
Pini balsameae resina	P. B. resina liquid. bals. Canad.	Terebinthina Canadens.	1 scr. to 1 oz. stimulant, diuretic
Terebinthina veneta	Pini laricis resina liquida		do. do.
Terebinthina vulgaris	Pini sylvestris resina liquida	Terebinthina vulgaris	do. do.
Oleum volatile pini	Pini sylv. oleum volat.	Terebinthinae oleum	composition, external
Oleum pini purissim.	Oleum terebinth. rectificat.	Oleum terebinth. rectif.	1 dr. to 2 oz. purgative, anthelmintic
	Enema terebinthinae		purgative
Pix burgundica	Pinus abies. Resina	Pix abietina. Resina praeparata	external, composition
	Pinus abies. Thus.	Abietis resina. Resina concreta	do. do.
Resina alba	Resina flava	Resina flava	external, do.
Unguentum resinosum	Unguentum resinae albae	Ceratum resinae	do.
Emplastrum resinosum	Emplastrum lithargyri cum resina	Emplastrum resinae	do.
Pix liquida	Pix liquida	Pix liquida	stimulant
	Aqua picis liquidae		½ lb. to 2 lbs. daily

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Unguentum picis	Unguentum picis liquidae	Unguentum picis liquidae	external
		Pix nigra	external
		Unguentum picis nigrae	do.
Piper cubeba	Piper cubeba	Cubeba	½ dr. to 1 dr. carminative
	Tinctura piperis cubebae		½ dr. to 1 dr. carminative
Piperis longi fructus	Piper longum	Piperis longi fructus	5 grs. to 10, hot, spicy
Piperis nigri fructus	Piper nigrum	Piperis nigri baccae	5 grs. to 10, hot, spicy
	Confectio piperis nigri	Confectio piperis nigri	½ dr. to 1, hot, aromatic
	Unguentum piperis nigri		hot, stimulant
Pistacia terebinthus	Resina liquida pist. tereb.	Terebinthina Chia	1 scr. to 1 dr. purgative
Pistaciae lentisci resina	Resina pistaciae terebinth.	Mastiche	10 grs. to 20, masticatory
Plumbi acetas	Plumbi acetas	Acetas plumbi	6 grs. daily, astringent
Unguentum acetatis plumbi	Plumbi acetatis unguentum	Ceratum plumbi acetatis	external
	Plumbi subacetatis liquor	Liquor plumbi subacetatis	do.
	Plumbi liquor subacet. comp.	Liquor plumbi subacetatis dilut.	do.
		Ceratum plumbi compositum	do.
Carbonas plumbi	Cerussa ; plumbi carbonas	Plumbi subcarbonas	do.
Unguentum carbonatis plumbi	Unguentum plumbi carbonatis		do.
Oxidum plumbi semivitreum	Plumbi oxyd. semivitr.	Plumbi oxydum semivitreum	do.
Emplastrum oxid. plumb. semi.	Emplastrum lithargyri	Emplastrum plumbi	do.
Oxidum plumbi rubrum			composition
Polygalae senegae radix	Radix polyg. senegae	Senegae radix	5 grs. to 10, subacrid
Decoctum polygalae senegae	Decoctum senegae	Decoctum senegae	½ oz. to 2, stimulant, expect.
Polygoni bistortae radix	Radix polygoni bistortae	Bistortae radix	1 scr. to 1 dr. astringent
Potassa	Potassa caustica	Potassa fusa	caustic
Potassa cum calce	Potass. caust. cum calce	Potassa cum calce	do.
Aqua potassae	Potassae causticae aqua	Liquor potassae	10 mins. to 30, lithontriptic
Acetas potassae	Potassae acetas	Potassae acetas	1 scr. to 1 dr. diuretic
Carbonas potassae	Potassae bicarbonas	Potassae carbonas	10 grs. to 20, antacid
Subcarbonas potassae	Potass. carb. e lixivo cinere	Potassae subcarbonas	chemical
Subcarbonas potassae purissimus	Potass. carb. e tartari crystallis	Potassae subcarbonas ex tartaro	5 grs. to 10, antacid

EDINBURGH.	DUBLIN.	LONDON.	*Dose.* *Nature.*
Subcarbonas potassae impurus	Lixivus cinis	Potassa impura	chemical
	Potassae carbonatis aqua	Liquor potassae subcarbonatis	½ dr. to 1 dr. antacid
Aqua super-carbonatis potassae			4 oz. to 8, antacid
Nitras potassae	Potassae nitras	Potassae nitras	10 grs. to 20, diuretic
	Potassae nitras purificat.		do. do.
Trochisci nitratis potassae			1 dr. to 2, diuretic
Sulphas potassae	Potassae sulphas	Potassae sulphas	1 dr. to 2, purgative
Sulphas potassae cum sulphure			½ dr. to 1 dr. do.
	Potassae bisulphas	Potassae supersulphas	1 dr. to 2, refrigerant
Sulphuretum potassae	Potassae sulphuretum	Potassae sulphuretum	5 grs. to 10, antipsoric
	Potassae sulphuret. aqua		antipsoric lotion
Supertartras potassae	Potassae bitartras	Potassae supertartras	1 dr. to 1 oz. laxative
Supertartras potassae impurus	Tartari crystalli	Tartarum	chemical
Tartras potassae	Potassae tartras	Potassae tartras	1 dr. to 2, laxative
	Potassae hydriodas		in solution
	Unguent. potassae hydriodat.		external
Pruni domesticae fructus	Prun. domest. fruct. siccat.	Pruna	1 oz. to 2, laxative
Prunus laurocerasus	Pruni laurocerasi folia		bitter, narcotic
	Aqua laurocerasi		5 mins. to 10, narcotic
Pterocarpi santalini lignum	Lign. pterocarp. santal.	Pterocarpi lignum	colouring
Punica Granatum	Pun. Granat. baccae, tunica exter.	Granati cortex	1 scr. to ½ dr. anthelmintic
	Pun. Granat. cortex radicis		do. do.
	Pun. Granat. flores		astringent
Pyrola umbellata	Pyrola umbellata		1 dr. or 2, diuretic
	Decoctum pyrolæ		1 oz. to 2, diuretic
Pyrus cydonia		Cydoniae semina	mucilaginous
		Decoctum cydoniae	1 dr. to 2, demulcent
Quassiae excelsae lignum	Quassia excelsa, lignum	Quassiae lignum	bitter, tonic
Tinctura quassiae excelsae	Tinctura quassiae		1 dr. to 2, bitter, tonic
Infusum quassiae excelsae	Infusum quassiae	Infusum quassiae	1 dr. to 2, do. do.

EDINBURGH.	DUBLIN.	LONDON.	*Dose.* *Nature.*
Quassiae simarubae cortex	Quassia simarouba, lignum	Simaroubae cortex	1 dr. to 2, bitter, tonic
	Infusum simaroubae	Infusum simaroubae	1 dr. to 2, do. do.
Quercus roboris cortex	Quercus robur, cortex	Cortex quercus	astringent
Decoctum quercus roboris	Decoctum quercus	Decoctum quercus	1 oz. to 2, astringent
	Extractum quercus		5 grs. to 10, do.
Ranunculus acris	Ranunculus acris, folia		acrid, emetic
Ranunculus flammula	Ranun. flammula, folia		do. do.
Ramni cathartici succus	Rhamnus catharticus, baccae	Rhamni baccae	purgative
Syrupus rhamni cathartici	Syrupus rhamni	Syrupus rhamni	½ oz. to 1 oz. cathartic
Rhei radix	Rheum palmatum, radix	Rhei radix	10 grs. to 20, cathartic
Tinctura rhei		Tinctura rhei	1 dr. to 2, tonic
	Tinctura rhei composita	Tinctura rhei composita	do. do.
Tinctura rhei et aloes			½ oz. to 1, purgative
Tinctura rhei et gentianae			1 dr. to 2, tonic
Infusum rhei	Infusum rhei	Infusum rhei	2 oz. to 4, cathartic
Vinum rhei			2 drs. to 4, tonic
Pilulae rhei compositae			10 grs. to 20, cathartic
	Extractum rhei	Extractum rhoei	10 grs. to 20, do.
Rheum undulatum	Rheum undulatum, radix		10 grs. to 20, do.
Rhododendri chrysanthi folia			5 grs. to 10, stimulant
Rhois toxicodendri folia	Rhus toxicodendron, folia	Toxicondendri folia	½ gr. to 2, narcotic
Ricinus communis semina	Ricinus	Ricini semina	preparation
Oleum fixum ricini communis	Oleum ricini communis	Ricini oleum	½ dr. to 1, purgative
Rocella tinctoria	Rocella tinctoria		colouring
Rosae caninae fructus	Rosa canina, fructus	Rosae caninae pulpae	acidulous
Conserva rosae caninae		Confectio rosae caninae	1 dr. to 2, acidulous
Rosae centifoliae petala	Rosa centifolia, petala	Rosae centifoliae petala	laxative
Aqua rosae centifoliae	Aqua rosae	Aqua rosae	fragrant
Syrupus rosae centifoliae	Syrupus rosae	Syrupus rosae rubrae	fragrant, demulcent
Rosae Gallicae petala	Rosa Gallica, petala	Rosae Gallicae petala	colouring, astringent
Mel rosae Gallicae	Mel rosae	Mel rosae	1 dr. to 2, astringent

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Conserva rosae Gallicae	Conserva rosae	Confectio rosae Gallicae	½ oz. to 1, astringent
Infusum rosae Gallicae	Infusum rosae acidum	Infusum rosae compositum	1 dr. to 2, do.
Syrupus rosae Gallicae			demulcent, astringent
Rosmarinus officinalis cacumina	Rosmarinus offic. cacum.	Rosmarini cacumina	fragrant
Spiritus rosmarini officinalis	Spiritus rosmarini	Spiritus rosmarini	½ dr. to 1, stimulant
Oleum volatile rosmarini officin.	Oleum rorismarini	Oleum rosmarini	2 mins. to 5, fragrant
Rubiae tinctorum radix	Rubia tinctoria, radix	Rubiae radix	1 scr. to 1 dr. emmenagogue
Rumex aquaticus	Rumex aquaticus, radix		astringent
Rumicis acetosae folia	Rumex acetosa, folia	Acetosae folia	acidulous
Rutae graveolentis herba	Ruta graveolens, folia	Rutae folia	10 grs. to 20, emmenagogue
Extractum rutae graveolentis	Extractum rutae		10 grs. to 20, do.
	Oleum rutae		3 mins. to 5, do.
	Conserva rutae	Confectio rutae	
Saccharum non purificatum	Saccharum	Saccharum	demulcent
Saccharum purificatum	Saccharum purificatum	Saccharum purificatum	do.
Syrupus simplex	Syrupus simplex	Syrupus simplex	1 dr. to 2, do.
Syrupus empyreumaticus	Syrupus empyreumaticus		do. do.
Sagapenum ; gummi resina	Sagapenum	Sagapenum	10 grs. to ½ oz. antispasmodic
Salinus pulvis	Pulvis salinus		1 dr. to 2, cathartic
Salix alba	Salix alba, cortex		10 grs. to 30, astringent
Salix fragilis	Salix fragilis, cortex		do. do.
Salix caprea	Salix caprea, cortex	Salicis cortex	do. do.
Salviae officinalis folia	Salvia		fragrant in tea
Sambuci nigrae flores	Sambucus nigra, flores	Sambuci flores	fragrant in tea
	Unguentum sambuci		external
Baccae sambuci nigrae	Samb. nigr. baccae		nauseous, demulcent
Succus spissatus sambuci nigrae	Succus spissatus sambuci	Sambuci unguentum	½ oz. to 1, demulcent
Cortex sambuci nigrae	Samb. nigr. cort. interior		2 drs. to 6, purgative
Sapo durus	Sapo durus	Sapo durus	in composition
		Ceratum saponis	external, detersive
Tinctura saponis camphorata	Linimentum saponis	Linimentum saponis compositum	do. stimulant

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Emplastrum saponaceum	Emplastrum saponis	Emplastrum saponis	external
	Empl. sap. comp. vel adhaerens		do.
Sapo mollis	Sapo mollis	Sapo mollis	do. detersive
Scillae maritimae radix	Scilla maritima, bulbus	Scillae radix	1 gr. to 3, diuretic
Radix scillae maritimae exsiccata	Pulvis scillae		do. do.
Acetum scillae	Acetum scillae	Acetum scillae	½ dr. to 1, do.
Syrupus scillae	Oxymel scillae	Oxymel scillae	1 dr. to 2, expectorant, emetic
Tinctura scillae	Tinctura scillae	Tinctura scillae	10 gtts. to 20, diuretic
Pilulae scilliticae	Pilulae scillae comp.	Pilulae scillae compositae	10 grs. to 20, diuretic
Scrophularia nodosa	Scrophularia nodosa, folia		foetid
	Unguentum scrophulariae		external, antistrumous
Sinapis albae semina	Sinapis alba, semina	Sinapis semina	1 oz. demulcent, laxative
	Pulvis seminum sinapis nigrae		1 dr. to 2, acrid, emetic
	Cataplasma sinapeos	Cataplasma sinapis	external, rubefacient
Smilacis sarsaparillae radix	Smilax sarsaparillae radix	Sarsaparillae radix	in composition
	Infus. sarsap. comp.		2 oz. to 4, alterative
Decoctum smilacis sarsaparillae	Decoctum sarsaparillae	Decoctum sarsaparillae	2 oz. to 4, alterative
	Syrupus sarsaparillae	Syrupus sarsaparillae	do. do.
	Decoctum sarsaparillae composit.	Decoctum sarsaparillae comp.	do. do.
	Extractum sarsaparillae	Extractum sarsaparillae	10 grs. to 20, do.
	Extract. sarsap. fluidum		½ oz. to 1, do.
Sodae subcarbonas impurus	Sodae carbonas venale	Soda impura	chemical
Subcarbonas sodae	Sodae carbonas	Sodae subcarbonas	10 grs. to 20, antacid
	Sodae carbonas siccatum	Sodae subcarbonas exsiccata	10 grs. to 15, do.
Carbonas sodae	Sodae bicarbonas	Sodae carbonas	15 grs. to 30, do.
	Sodae carbonatis aqua		1 dr. to 2, antacid
Aqua supercarbonatis sodae	Aqua carbonatis sodae acidula		½ lb. to 1, do.
Phosphas sodae	Sodae phosphas		6 drs. to 1 oz. purgative
Sulphas sodae	Sodae sulphas	Sodae sulphas	½ oz. to 1, do.
Murias sodae	Sodae murias	Sodae murias	½ oz. in clyster, cathartic
Sub-boras sodae	Sodae boras	Sodae sub-boras	10 grs. to 20, diuretic

EDINBURGH.	DUBLIN.	LONDON.	*Dose.*	*Nature.*
Mel sub-boratis sodae	Mel boracis	Mel boracis	detergent,	gargle
Potassae et sodae tartras	Sodae et potassae tartras	Soda tartarizata	1 dr. to 2,	laxative
	Sodae acetas		1 dr. to 2,	diuretic
Solani dulcamarae radix	Solanum dulcamara caules	Dulcamarae caulis	alterative	
	Decoctum dulcamarae	Decoctum dulcamarae	2 oz. to 4,	alterative
Spartii scoparii summitates	Spartium scoparium, cacumina	Spartii cacumina	1 dr. to 2,	diuretic
	Extractum spartii scoparii		5 grs. to 10,	do.
Spermaceti	Cetacea	Cetaceum	external	
	Unguentum cetacei	Unguentum cetacei	do.	
Ceratum simplex		Ceratum cetacei	do.	
Spigeliae marilandicae radix	Spigeliae marilandicae radix	Spigeliae radix	10 grs. to 20,	anthelmintic
Spongia officinalis	Spongia officinalis	Spongia	external	
	Pulvis spongiae ustae	Spongia usta	1 dr. to 1 oz.	deobstruent
Stanni limatura	Stannum	Stannum	chemical	
Pulvis stanni	Stanni pulvis		½ oz. to 1,	anthelmin.
Strychnos nux vomica	Strychnos nux vomica		5 grs. to 20,	anodyne
	Tinctura nucis vomicae		½ dr. to 1,	do.
	Extractum nucis vomicae		1 gr. to 5,	narcotic
Styracis benzoini balsamum	Styrax benzoe, resina	Benzoinum	in composition	
Tinctura benzoini composita	Tinctura benzoes composita	Tinctura benzoini composita	1 dr. to 2,	expectorant
Styracis officinalis balsamum	Styrax officin. resina	Styracis balsamum	fragrant	
	Styrax purificatum		do.	
Succinum	Succinum	Succinum	chemical	
Oleum succini	Oleum succini	Oleum succini	10 mins. to 20,	antispasmodic
Oleum succini purissimum	Oleum succini rectificatum		do.	
Sulphur		Sulphur	½ dr. to 2,	cathartic
Sulphur sublimatum	Sulphur sublimatum	Sulphur sublimatum	do.	do.
Sulphur sublimatum lotum	Sulphur sublimatum lotum	Sulphur lotum	do.	do.
		Sulphur praecipitatum	do.	do.
Unguentum sulphuris	Unguentum sulphuris	Unguentum sulphuris	external,	antipsoric
		Unguentum sulphuris compositum	do.	

EDINBURGH.	DUBLIN.	LONDON.	*Dose. Nature.*
Oleum sulphuratum		Oleum sulphuratum	10 mins. to 20, expectorant
Tamarindi Indicae fructus	Tamarindi fructus	Tamarindi pulpa	1 dr. to 2, demulcent
Tanaceti vulgaris folia	Tanacetum vulgare, folia		do. bitter, tonic
Flores tanaceti vulgaris			$\frac{1}{2}$ dr. to 1, do. do.
Toluiferae balsami balsamum	Balsamum Tolutanum	Balsamum Tolutanum	composition
Tinctura toluiferae balsami	Tinctura balsami Tolutani		$\frac{1}{2}$ dr. to 1, expectorant,
Syrupus toluiferae balsami	Syrupus balsami Tolutani	Syrupus Tolutanus	1 dr. to 2, do.
Triticum hybernum	Triticum hybernum, farina		demulcent
Tormentillae erectae radix	Tormentilla	Tormentillae radix	astringent
Tussilaginis farfarae folia	Tussilago farfara, radix	Tussilago	demulcent
Flores tussilaginis farfarae	——— ——— flores		do.
Valerianae officinalis radix	Valeriana officin. radix	Valerianae radix	1 scr. to 2, antispasmodic
	Tinctura valerianae	Tinctura valerianae	1 dr. to 2, do.
Tinctura valerianae ammoniata	Tinctura valerianae ammoniata	Tinctura valerianae ammoniata	$\frac{1}{2}$ dr. to 1, do.
	Extractum valerianae		5 grs. to 10, tonic
	Infusum valerianae		1 oz. to 2, antispasmodic
Veratri albi radix	Veratrum album, radix	Veratri radix	composition
	Decoctum veratri	Decoctum veratri	external
		Vinum veratri	$\frac{1}{2}$ dr. to 1, narcotic
	Unguentum veratri	Unguentum veratri	external
Tinctura veratri albi			$\frac{1}{2}$ dr. to 1, narcotic
Verbascum Thapsus	Verbascum Thapsus, folia		anodyne
Vinum album Hispanum	Vinum album Hispanum		stimulant
Violae odoratae flores	Viola odorata, flores		fragrant
Syrupus violae odoratae	Syrupus violae		colouring, fragrant
Vitis viniferae fructus		Uvae passae	demulcent
Ulmi campestris cortex	Ulmus campestris, cortex int.	Ulmi cortex	1 scr. to 1 dr. demulcent
	Decoctum ulmi	Decoctum ulmi	1 oz. to 2, do.
Winterae aromaticae cortex			$\frac{1}{2}$ dr. to 1, stimulant
Zincum	Zincum	Zincum	chemical
Carbonas zinci impurus	Zinci carbonas impurus	Calamina	external

EDINBURGH.	DUBLIN.	LONDON.	*Dose.*	*Nature.*
Carbonas zinci impurus praepar.	Zinci carbonas impurus praepar.	Calamina praeparata	external	
Ceratum carbonatis zinci impuri	Unguentum calaminaris	Ceratum calaminae	do.	
Oxidum zinci	Oxydum zinci	Zinci oxydum	5 grs. to 20,	tonic
Unguentum oxidi zinci	Unguentum zinci oxydi	Unguentum zinci	external	
Oxidum zinci impurum	Zinci carbonas impurum		do.	
Oxidum zinci impurum praepar.			do.	
Unguentum oxidi zinci impuri	Unguentum tutiae		do.	
Solutio acetatis zinci	Tinctura zinci acetatis		do.	
Sulphas zinci	Zinci sulphas	Zinci sulphas	10 grs. to 20,	emetic
Solutio sulphatis zinci			external	

NOTE.—The words in Italics in the first column are the scientific names of articles not in the Edinburgh Pharmacopœia.

N. B.—These are in general the doses for adults from twenty to sixty, but they may be diminished for children and people past the prime of life, nearly in the following proportions:

	Ages.	Proportionate doses.
Months	2	1/15
	7	1/12
	14	1/8
	28	1/6
Years	3	1/4
	5	1/3
	7	1/2
	14	2/3
	63	11/12
	77	5/6
	100	4/6

ENGLISH INDEX.

Page

Abstraction 67

Acetate of ammonia, water of 731
  copper 420
  iron 787
  lead 818
  potass 705
  quicksilver 797
  soda 716
  zinc, solution of 828

Acetous fermentation 105

Acid, acetic 675
    aromatic 938
    camphorated ib.
    dilute 674
    distilled ib.
    impure 234
    strong 675
    weak 673
  arsenious 311
  benzoic 678
  citric 680
    crystallized 237
  muriatic 667
    diluted 669
  nitric 660
    diluted 664
  nitro-muriatic 670
  nitrous 659
    diluted 664
  prussic 682
  stibiothiouic 753
  succinic 684
  sulphuric 238
    diluted 657
    pure 656
  tartaric 686
  vitriolic 238

Acids, officinal 221

Aconite 241

Acrid stimuli, officinal 217

Adhesive plaster 1060

Æthiops mineral 314

Affinity, cases of disposing 162
  compound 73

Page

Affinity, resulting 12
  simple 73, 161
  tables of 158

Agaric, female 337

Aggregation 52

Alcohol 829
  ammoniated 726
  diluted 249
  substances soluble in 173
    insoluble in ib.

Alkali, fixed mineral 612

Alkalies 688

Alkalines, officinal 221

Alkanet 285

Almond 274
  emulsion, mixture, or milk 930
  oil 862
  tree 274

Aloes 255

Aloetic pills 1020
  wine 974

Alum 262
  burnt or dried 750
  cataplasm 1030
  water, compound 827

Amber 631
  oil of 684
    rectified 877

Ammonia, and iron, muriate of 783
  bicarbonate of 731
  carbonate of 729
  diluted, water of 726
  gas 724
  hydro-sulphuret of 655
  liquor of 723
  muriate of 258
  preparations of 655
  real or gaseous, table of 725
  solution of subcarb. of 730
  spirit of 727
  subcarbonate of 728
  water of 722
    caustic ib.

Ammoniacal iron 784

Page
Ammoniac 264
Ammoniaret of copper 774
Ammoniated alcohol 726
    aromatic 888
    fœtid ib.
  copper 774
  iron 784
    tincture of 785
  oil 864
  tinctures 969
  tincture of guaiac 971
    cinchona ib.
    opium 971
Ammoniated spirit of colchicum 971
  submuriate of quicksilver 812
Angelica 287
Angustura bark 338
Animal substances, specific gravity of 138
Anise 544
Anodyne liniment 964
Antimonial powder 756
  wine 764
Antimoniated tartar 758
Antimony 292, 751
  preparations of 751
Antispasmodics 219
Apothecaries weight 110
Apparatus 40
Arabic emulsion 930
Arbor Dianae 103
Arbutus, red-berried trailing 305
Aromatic acetic acid 938
  ammoniated tincture 888
  confection 1012
  electuary ib.
  mixture of iron 936
  plaster 1058
  powder 1003
  sulphuric ether, with alcohol 968
  sulphuric acid ib.
  tincture 888
  vinegar 938
Arsenic 311
  preparations of 769
  sublimed white 769
    oxide of ib.
Arsenical solution 770
Arsenious acid 311
Asarabacca 323
Asphaltum 335
Ashes, pearl 561
Assafœtida 444
Assation, 82
Astringents, officinal 218
Atomic weights, of simple and compound bodies 163

Page
Atomic weights of salts 165
Attraction, elective 72
Attractions, divellent 73
    quiescent ib.
    relative 161
Avens, common 354
Avoirdupois weight 112
Axunge 245

B

Balaustine 570
Balm 515
Balsam of Canada 545
    Copaiva 407
    Gilead 234
    Peru 523
    Tolu ib.
  Carpatian 549
  Hungarian 549
  Peruvian 523
Balsam tree, sweet-smelling 523
Barbadoes aloes 255
  tar 335
Barks 372
Barm 370
Barilla 612
Barley 465
  water 909
Barras 548
Barytes 334
Baumé's and Beck's hydrometer, comparison of the degrees of 145
Bay tree 500
Bear's foot 462
Bearberry 305
Beaver 365
Bennet herb 454
Benzoic acid 678
Benzoin 629
Bicarbonate of ammonia 731
    potass 698
    soda 713
Bisulphate of potass 703
Bismuth 334, 771
Bistort 561
Bitter almonds 274
  apple 416
  infusion 894
  principle 574
  purging salt 508
  sweet 619
  wine 974
Bitumen 335
Bladder wrack 440
Blessed thistle 367
Blistering fly 352
    plaster 1058
Blue ointment 1044
Bones 532

Page

- Borate of soda 615
- Borax ib.
- Briar, wild 591
- Brimstone 632
- Broom 621
- Buchu 430
- Buckbean 516
- Buckthorn, purging 566
- Buds 21
- Burdock 306
- Burgundy pitch 545
  - plaster, compound 1060
- Butea, leafy 488
- Butter of antimony 755
- Butter-cups 576

C

- Caballine aloes 258
- Cabbage-tree bark 453
- Cadmia 647
- Cajeput tree 514
- Calamine 647
  - cerate of 1053
  - ointment ib.
  - prepared 825
- Calcined magnesia 745
  - zinc 825
- Calafacient plaster 1058
- Calendar, pharmaceutical 191
- Calomel 806
  - precipitated 810
  - sublimed 806
- Caloric 46
- Calx of quicksilver, white 812
- Calumba 392
- Camphor 347
  - liniment, compound 970
- Camphorated acetic acid 938
  - emulsion or mixture 932
  - oil 865
  - spirit 940
- Canadian turpentine 545
- Canella alba 351
- Caraway, common 360
  - water 879
- Carbon 49
- Carbonate of ammonia 728
  - of baryta 334
  - of iron, precipitated 778
  - of lead 558
  - of lime 345
    - indurated 345
    - precipitated 741
    - prepared 739
    - soft ib.
  - of magnesia 747
  - of potass 698
    - from potashes 694

Page

- Carbonate of potass from crystals of tartar 695
  - of soda, acidul. wat. of 715
    - commercial 612
    - dried 713
  - of zinc, impure 647
    - prepared 825
- Carbonization 99
- Cardamom, lesser 273
- Cardinal flower, blue 483
- Carminatives, officinal 217
- Carnation 428
- Carron oil 865
- Carrot, wild 426
  - poultice 1030
- Cascarilla 412
- Cassia fistula 360
  - cinnamon 493
  - water 880
- Castor 24, 365
  - oil 863
- Cataplasms 1028
  - alum 1030
  - mustard 1028
  - powder for 1008
  - simple 1028
  - yeast ib.
  - of charcoal 1029
- Catechu 231
- Cathartics, officinal 211
- Caustic, common, strongest 692
  - milder 693
  - lunar 765
  - ley 692
  - potass, with lime 693
- Cayenne pepper 355
- Centaury, smaller 371
- Cerates. *See* Ceratum, *Lat. Ind.* 1031
- Ceruse 558
- Chalk 345
  - potion or mixture 934
  - powder, compound 1004
  - prepared 740
- Chalybeate wine 787
- Chamomile 289
- Charcoal of wood 356
- Charring 58
- Chemical operations 51
- Cherry laurel 566
- Chian turpentine 556
- Chilies 355
- Chloride of antimony 755
  - of barium 172
- Christmas rose 461
- Cinchona 372
- Cinchonine 379
- Cinnamon tree 493
  - water 886
- Circulation 62, 81, 82

Page
Citric acid 234, 680
Citrine ointment 1049
Clarification 36, 39
Clitbur 306
Clove gillyflower 428
Clove-tree 434
Clyster, purging 936
  fetid ib.
Coagulation 39, 70
Cocculus Indicus 390
Cochineal 394
Cockspur pepper 355
Cohobation 67
Collection of simples 19
Cologne civil weight 128
Colombo 392
  spurious 393
Colophony 550
Coloquintida 416
Colouring fermentation 105
Colt's foot 638
Combination 71
  mechanical 34
Combustion 46, 97
Compounds, primary 71
  secondary ib.
Concentration 57
Condensation 59
Conein 403
Confections. See Confectio, *Lat. Ind.* 1008
Congelation 70
Conserves 1008
Conserve of orange peel 1011
  of hips ib.
  of red roses ib.
Contrayerva 432
Copaiva tree 407
Copper 417
  preparations of 775
  sub-acetate of 419
    prepared 773
  sulphate of 420
Copperas 442
Coriander 409
Corn rose 534
Corrosive muriate of quicksilver 803
  sublimate 804
Cowhage 331
Cow-itch ib.
Crab, black-clawed 346
Crabs claws ib.
  stones ib.
Craw fish ib.
Cream 84
  of tartar 565
Cresses, water 609
Crocus 410

Page
Crocus of antimony 759
Crucibles 54
Crystallization 85
Crystals of tartar 565
  of nitrate of silver 765
Cubebs 555
Cucumber, wild 517
Cuckow flower 359
Cummin 417
  plaster 1059
Cyanuret of mercury 813

D

Damson, bitter 573
Dandelion 502
Deaquescence 78
Decantation 36
Decoction 81
Decoctions. See Decoctum, *Lat. Ind.* 899
Decomposition 83
  mutual cases of 161
Decrepitation 58, 99
Deflagration 98
Deliquescence 78
Deliquescent salts 175
Demulcents, officinal 207
Dephlegmation 67
Deposition 36
Despumation 40
Diaphoretics, officinal 208
Digestion 81
Dill 286
  water 879
Dilution 35
Disaggregation 52
Disoxygenizement of metallic oxides and acids 101
Dissolution 83
Distillation 60
Distilled waters 878, 882
  spirits 883
Diuretics, officinal 213
Division, mechanical 28
Dock, great water 593
Dover's powder 1005
Dragon's blood 568
Dryabalanops camphora 432
Drying of herbs and flowers 845

E

Earthenware 42
Earths 733
East Indian opium 536
Eau de Luce 973
  medicinale d'Husson 400

Page

- Ebullition 56, 82
- Edulcoration 79
- Effervescence 83
- Efflorescence 78
- Efflorescent salts 175
- Egg 533
- Egyptian weights 131
- Elaine 245
- Elaterium 517, 859
- Elder, common 601
  - ointment 1040
  - rob 357
- Elecampane 476
- Electrical system of bodies 156
- Electuaries. See Electuaria, *Lat. Ind.* 1008
- Elemi 283
  - ointment of 1038
    - comp. ib.
- Eleutheria 412
- Elixir of health 971
- Elm bark 639
- Elutriation 35
- Emetic tartar 752
- Emetics, officinal 211
- Emetine 480
- Emmenagogues, officinal 213
- Emollients and demulcents, off. 207
- Empyreumatic oils 876
- Emulsions 930
- Emulsion, almond ib.
  - Arabic ib.
  - camphor 932
- Enema, opiate 937
  - turpentine 936
- English and French weights, basis of comparison 122
- Epispastic ointment, milder 1042
  - stronger 1043
- Epispastics, officinal 216
- Epsom salt 508
- Errhines, officinal 209
- Eryngo-leaved liverwort 504
- Escharotics, officinal 216
- Ether, nitrous 838
  - rectified 832
  - sulphuric 831
    - with alcohol 833
- Ethereal oil 837
  - liquor, oily 838
    - sulphuric 833
  - spirit, nitrous 842
- Euphorbia, officinal 436
- Evaporation 56
  - spontaneous 56, 78
- Expectorants, officinal 210
- Expression 38
- Exsiccation 57

Page

- Exsiccation of simples 19
- Extinction 82
- Extract 79
- Extracts. See Extractum, *Lat. Ind.* 984
- Extraction 79
  - of pulps 859
- Extractive 987

F

- Fats 24
  - solubility of, in alcohol and sulphuric ether 174
- Fatty compounds 1031
- Fennel, sweet 287
  - water 880
- Ferment 370
- Fermentation 104
- Fern, male shield 324
- Feshook 265
- Fetid aloes 258
  - clyster 936
- Feverfew, common 286
- Fig-tree 446
- Figwort, knotty-rooted 607
- Filings of iron, purified 776
- Filtration 36
- Firs 545
  - false 546
- Fixed fluid oils 174
- Flag, sweet 243
- Flax, common 506
  - purging ib.
- Flexibility 29
- Florentine orris 483
- Flour 637
- Flower buds 21
- Flowers of benzoin 628
  - of sulphur, washed 649
- Fluids of various kinds, specific gravity of 139
- Fluxes 513
- Fœtid aloes, 258
  - stimuli, officinal 219
- Fowl, dunghill, egg of 533
- Foxglove 428
- Frangibility 219
- Frankincense, common 545
- French meridional or decimal weight 122
- Frigorific mixtures 155
- Fruits 22
- Fuel 46
- Fuming liquor of Boyle 656
- Fungi 22
- Furnaces 49

Page
Fusion 52
  watery 58

G

Galbanum 342
Gallipot 548
Galls 448
Galvanic circles 157
Gamboge 450
Garlic 252
Gases, specific gravities of 141
Gazification 68
Gelatinization 70
Gentian 452
Gentianine ib.
German leopard's bane 309
German weights and measures 127
Gillyflower, clove 428
Ginger 270
Glass 42
  of antimony 295
Gourd, squirting 517
Granulation 33
Grapes 642
Gravity, specific 26, 134
Greek liquid measures, ancient 130
  weights, ancient ib.
  medicinal weights 131
Groats 333
Guaiac 458
Gum Arabic 226
  gutt 450
  mimosa 226
  plaster 1064
  resins 998
  tragacanth 326
  troches 1019

H

Hartshorn 371
  burnt 743
Hart 371
Heat and fuel 46
Heat, table of the effects of 150
  high degrees of 153
Hedge hyssop 457
Hellebore, black 461
  stinking 462
  white 640
Hemlock 401
  fir 548
  poultice 1030
Henbane, common 473
Hepatic aloes 255
Heptree 591
Herbs 21

Page
Herbs and flowers, drying of 845
Hindoostan weights 129
Hogs lard 245
  prepared 1032
Honey 513
  of borax 926
  clarified 925
  of roses 927
Hop 467
Horehound, white 512
Horse radish 396
  aloes 258
Horn 371
  burnt 743
Humectation 82
Hydriodate of potass 709
Hydrochloric acid gas 668
Hydrocyanic acid 277
Hydrometer, Baumé's and Beck's, comparison of the degrees of 145
Hydrometers, percentage 142
Hydrosulphuret of ammonia 655
Hydrothionic acid 656
Hydro-sulphuric acid ib.
Hyosciamine 475
Hyssop 475
  hedge 457

I

Iceland moss 504
Immersion 82
Incense, white 548
Incineration 59, 99
Incompatible salts 162
Inflammation 97
Inflammables, specific gravity of 134
Infusion 80
Infusions. *See* Infusum, *Lat. Ind.* 889
Insects 24
Insolation 82
Inspissation 57
Integrant particles 71
Intermediate particles 72
Iodine 477
Ipecacuan 479
Iron 438
  preparations of 776
  filings 440
    purified 776
  scales of 441
    purified 776
  wire 440

J

Jagged moonseed 390
Jalap 405

Page
James-town weed 424
Jewish weights 131
Juices. *See* Succi spissati, *Latin Index,* 850
Juniper 484

K

Kermes mineral 752
Kino 487, 569

L

Ladies smock, meadow 359
Lard 245
Larches 545
Laudanum, liquid 960, 977
Lavender 501
Lead 557
  plaster 1061
  preparations of 818
Leaves 21
Leech 463
Leek 254
Lemon tree 389
  peel water 880
Lemons, essential salt of 553
Leopard's bane, German 309
Lettuce, strong scented 491
  garden ib.
Ley, caustic 692
Leys 79
Lichens 22, 504
Lime 736
  carbonate of 345
  preparations of 736
  water 737
    compound 890
Liniments. *See* Linimenta, *Latin Index,* 1031
Linseed 506
  oil of 863
Liquefaction 52
Liquid laudanum 960, 977
Liquids, freezing points of 150
  volatilized 151
Liquor. *See* Liquor, *Lat. Ind.*
Liquorice 445
Liquor, fuming, of Boyle 656
Liquors, spiritous, contents of 643
Litharge 558
  plaster 1061
    with resin 1062
Litmus 589
Liver of sulphur 652
Liverwort, eryngo-leaved 504
Logwood 460
Long measure 119

Page
Loosestrife 507
Lotion 79
Lunar caustic 765
Lupuline 468
Lutes 43
Low wines 247

M

Mace 521
Maceration 81
Madder 592
Magnesia 745
  calcined ib.
  carbonate of 745
  preparations of 747
  subcarbonate of 507
  sulphate of 750
Makaw-tree 397
Mallow, common 509
Malt 463
Manna 510
Manganese 507
Marble 345
Marjoram, sweet 532
  common 531
Marsh-mallow 261
Marsh trefoil 516
Martial flowers 783
Mastiche 556
Materia medica 225
  classific. of veget. 180
  physiological classification of the 205
Meadow crowfoot, upright 576
Meadow saffron 399
  vinegar of 939
Measure, former English wine 116
  imperial standard 115
  long 119
  London Pharmacopœia 115
  English ale 116
  new French 119
  Scots liquid 117
Measures 24
  and weights, principles of the new imperial 109
  of capacity 123
  comparison of 116
  of length 123
  of weight 124
  used in France before the revolution 119
Measurement, fortuitous or approximate 131
Meconic acid 539
Medicines, classification of forms of 184, 186
Menstruum 76

Page

- Mercurial ointment, milder 1047
    - stronger 1045
    - pills 1026
- Mercury 469
    - corrosive muriate of 804
    - cyanuret of 813
    - preparations of 790
- Metals, specific gravity of 135
- Metallic oxides, disoxygen. of 101
    - solutions, colour of precipitates thrown down from 177
- Mezereon 422
- Mill mountain 506
- Mineral pitch 335
    - substances 24
    - tar 335
    - waters 298
- Mixture, mechanical 33
- Mixtures. See Mistura, *Lat. Ind.* 930
- Mixtures, frigorific 155
    - officinal 930
- Molasses 595
- Monk's hood 241
- Moonseed, jagged 390
- Morphia 559
- Mosses 22
- Mother-water 87
- Moxa 322
- Mucilage of acacia 907
    - of gum-arabic ib.
    - of gum-tragacanth 908
    - of quince seed 909
    - of starch 908
- Mullein, great 641
- Muriate of ammonia 268
    - and iron 783
    - of baryta 733
        - solution of 735
    - of iron, tincture of 782
    - of lime 741
    - of quicksilver 804
    - of soda 617
- Muriated quicksilver, corrosive 803
- Muriatic acid 667
    - diluted 669
    - gas 668
- Musk 518
    - mixture 934
- Mustard 607
    - cataplasm 1028
- Mutton-suet 244
    - prepared 1033
- Myrrh 525

N

- Naphtha 335
- Narcotine 538
- Narcotics, officinal 221

Page

- Nightshade, deadly 328
    - woody 619
- Nitrate of potass 563
    - purified 705
    - of silver 767
        - crystals of 765
        - melted 767
- Nitre, purified 563
- Nitric acid 660
    - diluted 664
    - oxide of quicksilver 795
- Nitrous acid 659
    - diluted 664
    - ether 838
        - spirit of 842
    - ethereal spirit ib.
- Nitro-muriatic oxide of antimony 755
- Nuremberg weight 127
- Nutgalls 448
- Nutmeg tree 521

O

- Oak, common British 575
- Oats 333
- Officinal plants 192
- Oils. See Oleum, *Lat. Ind.* 867
- Oils, empyreumatic volatile 876
    - essential 869
    - solubility of, in alcohol and acetic ether 174
    - volatile 867, 869
- Oil and suet in various fats, proportion of 174
- Oily compounds 1031
    - ethereal liquor 838
- Ointments. See Unguentum, *Lat. Ind.*
- Olibanum 486
- Olive tree 529
- Onion 254
- Operations, chemical 51
    - mechanical 24
    - pharmaceut. in Paris 187
- Opiate electuary 1015
    - enema 937
    - powder 1006
    - pills 1023
- Opium 535
    - vinegar of 939
- Opoponax 542
- Orange, Seville 387
    - peel-water 880
- Organic acids 169
    - bodies, composition of 167
- Orchill 589
- Oxide of antimony, nitro-muriatic 755
    - with phos. of lime 756
    - of arsenic 311

Page
Oxide of antimony, sublimed 769
of iron, black 776
purified ib.
red 781
of lead, white 558
red 559
semivitrified 558
of manganese, black 509
of quicksilver, red 794
ash-coloured 793
of quicksil. red, by nit. ac. 795
nitric ib.
sulphuric 802
of zinc 822
impure 647
prepared 825
Oxides and acids, metallic, disoxygenizement of 101
Oxygen 96
Oxygenizement 97
Oxymel, simple 928
of meadow saffron ib.
of squills 929
of verdegris ib.
Oxymuriate of quicksilver 803
Oyster 347
shell lime 736
shells, prepared 347, 740

P

Palm oil 397
Palma Christi 585
Panary fermentation 105
Paregoric elixir 961, 971
Particles, integrant 71
Peach leaves 278
Pearl ashes 561
barley 465
Pellitory of Spain 291
Pennyroyal 516
water 880
Pepper, black 553
Cayenne 355
Jamaica 526
long 555
Peppermint 515
water 880
Persulphate of mercury 800
Peruvian balsam 523
bark 372
Petroleum 335
Pharmaceutical calendar 191
phenomena 154
operations 187
processes, classification of 184
Pharmacopœias, catalogue of 222
Pharmacy, art of 17

Page
Pharmacy, elements of ib.
mechanical operations of 24
science of 17
systematic view of preparations of 185
Phosphate of lime, precipitated 745
soda 716
Pills. See Pilula, *Lat. Ind.* 1019
Pimento tree 526
water 880
Pines 545
Pink, Carolina 623
clove 428
Pissabed 502
Pitch, Burgundy 545
black 545
mineral 335
ointment of 1039
Plants, officinal, in the British pharmacopœias 192
Plasters. See Emplastrum, *Lat. Ind.* 1031
Plumbago 439
Plum-tree 566
Poison nut-tree 626
oak 585
Polypody 324
Pomegranate-tree 570
Poppy, red 534
white ib.
heads 535
Porcelain 45
Potashes 561
Potass 692
acetate of 705
bicarbonate of 698
bisulphate of 703
carb. of, from crystals of tartar 695
carb. of, from potashes 694
caustic 692
with lime 693
hydriodate of 709
liquor of 688
melted 692
nitrate of 563
purified 705
solution of 688
sulphuret of 651
subcarbonate of 693, 694
solution of 697
pure 694
supercarb. of solution of 700
sulphate of 564, 701
with sulphur 704
supertartrate of 565
impure ib.
supersulphate of 702
tartrate of 707

Page

- Potass, water of caustic 689
  - with lime 693
- Potass and iron, tartrate of 785
  - and soda, tartrate of 720
- Potion of carbonate of lime 934
- Poultice, carrot 1030
  - hemlock ib.
  - for cataplasms 1008
- Powders. See Pulvis, *Lat. Ind.* 1000
- Precipitate 84
- Precipitation ib.
- Preservation of simples 19
- Proof-spirit 249
- Proof-vinegar 235
- Prunes 566
- Prussian blue 442
- Prussic acid 277, 682
- Pulps, extraction of 859
- Pulverization 30
- Purging salt, bitter 508
  - clyster 936
  - buckthorn 576
- Putrefactive fermentation 106
- Pyrelaines 877
- Pyrotechny 93

Q

- Quassia tree 574
- Quassine ib.
- Quicklime 344
- Quicksilver 469
  - ammoniated submuriate of 812
  - ash-coloured oxide of 793
  - black oxyde of ib.
    - sulphuret of 814
  - mild submuriate of 806
  - persulphate of 800
  - preparations of 790
  - purified ib.
  - red oxide of 794
    - sulphuret of 816
  - solution of oxymuriate of 806
  - submuriate of 807
  - with chalk 792
    - magnesia 791
  - white precipitated 812
  - yellow subsulphate of 802
- Quince seeds 572
- Quinine, sulphate of 994

R

- Raisins, sun 645
- Rattlesnake root 560
- Rectification 67
- Rectified spirit 246

Page

- Red precipitate 794
  - lead 559
  - oxide of lead ib.
- Resins 22, 978
- Refrigerants, officinal 220
- Resinous cerate 1037
  - stimuli, officinal 219
  - ointment 1037
  - plaster 1061
- Rhabarbarine 582
- Rhatany root 490
- Rheumine 582
- Rhododendron 583
- Rhubarb 577
  - wine 977
- Rock oil 335
- Roman liquid measure, ancient 129
  - weights, ancient 130
- Roots 20
- Rose, Christmas 461
  - corn 534
  - damask 590
  - dog 591
  - red 590
- Rose-water 880
- Rosemary 592
- Rosin 545
  - yellow 1000
- Rubefacient, officinal 216
- Rue 594
- Rust of iron 778

S

- Saccharine fermentation 104
- Saffron crocus 410
  - meadow 399
- Sagapenum 598
- Sage 600
- Sal ammoniac 268
- Saline fluids, specific gravity of 138
  - solids, specific gravity of 135
  - substances, solubility of, in alcohol 173
- Salifiable bases 169
- Sallow, great round leaved 599
- Saltpetre 565
- Salt of amber 684
  - of benzoin 678
  - of tartar 687
- Salts, anomaly in the different solubility of 172
  - efflorescent and deliques. 175
  - incompatible 162
  - proportion of water of crystallization in 175
  - specific gravity of solutions of 138
  - table of the solubility of 169

Page

- Saponaceous liniment 964
  - plaster 1062
- Sarsaparilla 610
- Sassafras 501
- Saturnine ointment 1051
- Saunders wood, red 568
- Savine 485
- Scales of iron 441
  - purified 776
- Scammony 404
- Scotch fir 545
  - troy weight 114
  - tron weight 115
- Scurvy grass, common 396
- Sea salt 617
  - squills, dried 849
- Seeds 22
- Semivitrified oxide of lead 558
- Seneka 560
- Senna 362
- Separation, mechanical 34
- Septfoil 636
- Settiswort 462
- Seville orange 387
- Sherry 642
- Sialagogues, officinal 215
- Sifting 34
- Silver leaf 307
  - preparations of 765
- Simple affinity, tables of 158
- Simples, collection and preservation of 19
  - list of, to be collected through the year 187
- Simarouba 573
- Sinapism 1029
- Snake-root, Virginian 307
- Snake-weed 561
- Soap 602
  - liniment, compound 964
  - cerate 1052
  - plaster 1062
- Socotorine aloes 255
- Soda, acetate of 716
  - bicarbonate of 713
  - carbonate of 713, 714
    - dried 713
  - impure 612
  - phosphate of 716
  - muriate of 617
  - solution of supercarbon. of 715
  - subcarbonate of imp. 612, 711
    - dried 712
  - sulphate of 619, 719
- Solids, melting point of 150
  - and liquids volatilized 151
- Solubility of saline and other substances 173
  - of fats, &c. 174

Page

- Solubility of salts 169
  - of oils 174
- Solution 76
- Solutions. See Solutio, *Lat. Ind.*
- Solutions, metallic 177
- Solvend 76
- Solvent ib.
- Sorrel, common 594
- Spanish fly 352
  - juice 456
- Spar, heavy 334
  - ponderous ib.
- Spearmint 515
  - water 880
- Spearwort, lesser 576
- Specific gravity 26, 134
  - gravities indicated in the British Pharmacopœias 142
  - gravities indicated in the French Pharmacopœia, &c. 144
- Spermaceti 621
- Spices, officinal 217
- Spirits. See Spiritus, *Lat. Ind.*
- Spirits, distilled 883
  - sp. gr. of 250
- Sponge 624
  - powder of burnt 850
- Sprouts 21
- Spruce fir 545
- Spunk 337
- Spurge olive 422
- Squill 605
  - dried or prepared 849
  - pills 1025
  - vinegar of 940
- Stag 371
- Stalks 21
- Starch 637
  - elementary changes of 168
  - of wheat 279
- Starches, analysis of 168
- Stavesacre 427
- Stearine 245
- Steel 439
- Stibiothionic acid 753
- Still 61
- Storax 628
  - purified 999
  - pills 1024
- Strengthening plaster 1060
- Styptic powder 750
  - water 827
- Subacetate of copper 419
  - prepared 773
  - of lead 820
- Sub-borate of soda 615
- Subcarbonate of ammonia 728
  - iron 778
  - potass 693, 69

Page
Subcarbonate of lead 558
    magnesia 507
    potass 694
        pure ib.
        solution of 697
    soda 612, 711
        dried 712
Sublimation 67
Submuriate of quicksil. sublimed 806
    precipitated 809
    ammoniated 812
Subnitrate of bismuth 771
Subsulphate of quicksil. yellow 802
Sudorifics, officinal 208
Suet 244
    prepared 1033
Sugar 595
    cane ib.
    of lead 819
Sugars, analysis of 168
Sulphate of alumina and potass 262
    of baryta 334
    of copper 420
    of iron 442, 654, 780
        dried 781
    of magnesia 750
    of potass 564, 701
        with sulphur 704
    of quinine 994
    of soda 172, 619, 719
    of zinc 826
Sulphur, brown antimoniated 753
    ointment 1054
        compound ib.
    precipitated 650
    roll 632
    sublimed ib.
    washed 649
        sublimed ib.
Sulphuret of antimony 292
        precipitated 752
        prepared 751
    of potass 651
        water of 653
    of quicksilver, black 814
        red 816
Sulphuretted oil 866
    ox. of antimony vitrif. 295
Sulphuric acid, commercial 238
        diluted 637
        aromatic 968
    ether 831
        with alcohol 833
    ethereal liquor ib.
    oxide of quicksilver 802
Sun-raisins 645
Supercarbonate of soda, solution of 715
Supercarb. of potass, solution of 700
Supersulp. of alumina and potass 262

Page
Supersulphate of potass 702
Supertartrate of potass 565
Sweet almonds 274
Sweet flag 243
Swedish weights and measures 129
Syrups. *See* Syrupus, *Lat. Ind.* 911

T

Table for converting ounces Troy, &c. into decimals of the apothecaries pound 111
    for converting grammes into poids-de-marc, &c. 125
    for converting grains, drachms, &c. into grammes 126
    of antimonial preparations 294
    of mercurial ditto 471
    of the sp. gr. of mixtures of alcohol and water 250
    of the contents of different wines and spiritous liqs. 643
    of the weight in grs. of various measures of fluids 143
Tables for converting measures 117
Tamarind tree 634
Tansy 635
Tar 551
    Barbadoes 335
    water 890
    ointment 1038
Tartar 565
    emetic 758, 760
    crystals or cream of 565
    salt of 687
    of iron 785
Tartarized antimony 758
    iron 785
    soda 721
Tartrate of antimony 760
        and potass 758
    of potass 707
        and iron 785
        and soda 720
Temperature 53
Temperature at which various pharmaceutical phenomena take place 154
Tenacity 29
Thebaic electuary 1015
    pills 1023
    tincture 960
Thermometers, correspondence between different 149
Thermoms. Fahr. Centigrade, and Reaumur, comparative scale of 145
Thistle, blessed 367
Thorn-apple 424
Tin-filings 625

Page
Tin, preparations of 822
Tincture. *See* Tinctura, *Lat. Ind.* 941
Tobacco 527
    wine 976
Tonics, officinal 218
Tormentil 636
Torrefaction 58
Touchwood 337
Trochiscation 35
Troy weight, imperial standard 109
Tragacanth shrub 326
Troches. *See* Trochisci, *Lat. Ind.* 1017
Turmeric 421
Turkey opium 536
Turnsole 589
Turpentine, common 545
    Chian, 556
    Cyprian, 549
    enema 936
    liniment 1038
    oil of 545
    Strasburgh 549
    Venice 545
Turpeth, mineral 802
Tutty 647
    prepared 825
Twigs 27

U

Ustulation 58

V

Valerian, wild 639
Vaporization 55, 56
Vapours, specific gravity of 141
Vegetable materia medica, classification of 180
Vegetable principles, natural classification of 178
Vegetable simples 20
Vegetable substances, specific gravity of 136
Vegetable substances, ultimate analysis of 168
Vegetables, preparation of 844
    drying of 845
Veratria 641
Verdegris 419
    distilled 420
    prepared 773
Verjuice 645
Vessels 40
Vine 645
Vinegar 234
Vinegars. *See* Acetum, *Lat. Ind.*
Vinous fermentation 105
Violet, sweet-smelling 644
Vitriol, blue 420
    green 442
Vitriolic acid 238
Volatile liniment 864
    oils 867
        empyreumatic 877
Volatile pungent stimuli, officinal 220

W

Water-cress 609
Watery fusion 558
Waters. *See* Aqua, *Lat. Ind.* 688
Waters, mineral 298
Wax, yellow 367
    white 368
    ointment of white 1036
        of yellow ib.
    plaster 1056
Weights, atomic, of simple and compound bodies 163
    of salts 165
Weights and measures 24, 109
Weights and measures used in France before the Revolution 119
Weights and measures, principles of the new imperial 109
Weights and measures, English and foreign, correspondence between 119
Weights, foreign 127
    ancient, Roman and Greek 130, 131
    Jewish and Egyptian 131
Whale 621
Wheat 637
White lead 558
White ointment 1036
Whortleberry 305
Willow, crack and white 599
Willowstrife, purple-spiked 507
Wine 642
Wines. *See* Vinum, *Lat. Ind.* 973
Wines, contents of different 643
    low 247
    medicated 973
Winter green 572
Winter's bark 646
Witherite 334
Wolfsbane 241
Woods 21
Wood-sorrel, common 533
Woody nightshade 619
Wormseed 319
Wormwood, common 321
Woulfe's apparatus 63
Wrack, yellow bladder 447

Y

Yeast 370
    cataplasm 1028
Yellow bladder wrack 447
    resin 1000

Z

Zinc 646
    impure oxide of 647
    preparations of 822

LATIN INDEX.

Page

Abietis resina 545
Absinthium 321
Acacia catechu 231
    vera 226
Acetas potassae 705
    ferri 787
    hydrargyri 797
    plumbi 818
    sodae 716
Acetatis ferri tinctura 788
        cum alcohol tinctura 789
    ammoniae aqua 731
    zinci tinctura 828
Acetosella 533
Acetum 234
    colchici 939
    distillatum 674
    opii 939
    scillae 940
    vini 234
Acidum aceticum 675
        aromaticum 938
        camphoratum ib.
        dilutum 674
        distillatum ib.
        fortius 236
        forte 675
        scilliticum 940
        tenue 675
        impurum 234
    arseniosum 311
    benzoicum 678
    citricum 237, 680
        crystallizatum 237
    muriaticum 667
        dilutum 669
    nitricum 660
        dilutum 664
    nitro-muriaticum 670
    nitrosum 659
        dilutum 664
    prussicum 652

Page

Acidum succinicum 684
    sulphuricum 238
        aromaticum 968
        dilutum 657
        purum 656
    tartaricum 686
    vitriolicum 238
Aconitum napellus 241
    paniculatum ib.
Acorus calamus 243
Adeps ovillus 244
        praeparatus 1033
    praeparata 1033
    suillus 245
        praeparata ib.
Ærugo 419
Æther sulphuricus 831
        cum alcohole 833
            aromat. 968
    nitrosus 838
    rectificatus 832
Ætheris sulphurici spiritus 833
    nitrosi spiritus 842
    nitrici spiritus ib.
Æthiops mineralis 814
    vegetabilis 447
Agaricus 337
Alcohol fortius, *Ed.* 246
    Lond. Dub. 829
    ammoniatum 726
        aromaticum 888
        fœtidum ib.
    dilutius 249
Allium cepa 254
    sativum 252
    porrum 254
Aloe hepatica 255
    socotorina ib.
    spicata 256
    vulgaris 255
Althaea officinalis 261
Alumen 262

Page
Alumen exsiccatum 750
siccatum 750
Aluminis liquor compositus 827
Ammoniacum 264
Ammoniaretum cupri 774
Ammoniae acetatis aqua 731
liquor 732
aqua 722
diluta 726
bicarbonas 731
carbonatis aqua ib.
carbonas 729
subcarbonatis liniment. 864
causticae aqua 722
et ferri murias 783
hydro-sulphuretum 655
linimentum 864
liquor 723
subcarbonatis 730
murias 268
spiritus 727
aromaticus 888
fœtidus ib.
succinatus 972
subcarbonas 728
solutio subcarbonatis 730
sulphureti aqua 655
Amomum cardamomum 272
repens ib.
zingiber 270
Amygdalae dulces 274
amarae ib.
Amygdalus communis ib.
persica 278
Amylum 279
Amyris elemifera 283
Gileadensis 284
kataf 285
Zeylanica retzii 284
Anchusa tinctoria 285
Anethum fœniculum 287
graveolens 286
Angelica archangelica 287
Angusturae cortex 338
spuria 340
Anisi semina 544
Anisum 344
Anthemis nobilis 289
pyrethrum 290
Antimonium 292
tartarizatum 760
Antimonii crocus 759
cum phosphate
calcis 756
oxydum sulphuratum
vitrificatum 295
oxydum nitromuriat. 755
et potassae tartras 760

Page
Antimonii sulphuret. praecipit. 792
praepar. 751
sulphuretum 292
tartras 758
tartratis vinum 764
vitrum 295
Aqua 296
acetatis ammoniae 731
ammoniae 722
causticae ib.
diluta 726
anethi 879
calcis 737
composita 890
carbonatis ammoniae 731
sodae acidula 715
carui 879
chlorinii 671
cinnamomi 880
citri aurantii ib.
medicae ib.
cupri ammoniati 775
distillata 878
fœniculi 880
lauri cassiae 880
cinnamomi ib.
laurocerasi 881
menthae piperitae 880
pulegii ib.
sativae ib.
viridis ib.
muriatis barytae 735
calcis 742
myrti pimentae 880
pimento ib.
picis liquidae 890
potassae 688
causticae 689
pulegii 880
rosae ib.
sodae carbonatis 712
styptica 827
subcarbonatis kali 697
sulphureti potassae 653
ammoniae 655
supercarbonatis potassae 700
sodae 715
Aquae stillatitiae 879
distillatae ib.
calcis linimentum 865
Arabicum gummi 226
Arbor Dianae 103
Arbutus uva ursi 304
Arctium lappa 306
Argentum ib.
Argenti nitras 767
nitratis crystalli 765
Aristolochia serpentaria 307

Page
Armoraciae radix 396
Arnica montana 309
Arsenicum album 311
  sublimatum 769
Arsenici oxydum album sublim. 769
Artemisia absinthium 321
  Chinensis 322
  santonica 319
Asarum Europaeum 323
Aspidium filix mas 324
Asphaltum 335
Assafoetida 444
Astragalus tragacantha 326
  verus ib.
Atropa belladonna 328
Aurantii baccae et cortex 387
Aurantium Hispalense 387
Avena sativa 323
Axungia porcina 245

B

Balaustinum 570
Balsamum Canadense 549
  Copaibae 407
  Gileadense 284
  myroxyli Peruiferi 523
  Peruvianum 523
  styracis benzoini 629
    officinalis ib.
  Tolutanum 523
Bardana 306
Barilla 612
Barytae carbonas 334
  murias 733
  muriatis solutio 735
  sulphas 334
Belladonna 328
Benzoinum 629
Bicarbonas sodae 713
  ammoniae 731
Bismuthi subnitras 771
Bismuthum 334
Bistortae radix 561
Bitumen petroleum 335
Boletus igniarius 337
Bonplandia trifoliata 338
Boras sodae 615
Borax 615
Bubon galbanum 342
Butea frondosa 848
Boswellia serrata 342

C

Cajuputi oleum 514
Calami radix 243

Page
Calamina 647
  praeparata 825
Calaminaris 647
Calcis aqua 737
  carbonas 345
    praeparatus 739
    praecipitatum 741
  linimentum 865
  liquor 737
  muriatis solutio 741
  murias ib.
  phosphas praecipitatum 810
Calculi cancrorum 346
Callicocca ipecacuanha 479
Calomelas 806
  praecipitatum 745
  sublimatum 806
Calumba. See Columbo.
Calx 344, 736
  e testis 736
Cambogia 450
Camphora 347
  See also Laurus and Dryabalanops.
Cancer astacus 346
  pagurus ib.
Cancrorum lapilli 346
Canella alba 351
Cantharis vesicatoria 352
Capsicum annuum 355
Carbo ligni recens 356
Carbonas ammoniae 729
  barytae 334
  calcis 345
    praeparatus 739
    praecipitatum 741
  ferri 778
    praecipitatus ib.
  magnesiae 747
  plumbi 558
  potassae 698
  sodae. *Ed.* 713. *Lond.* 714
    siccatum 713
  zinci impurus 647
    imp. praeparatus 825
Cardamine pratensis 359
Cardamomum minus 273
Carduus benedictus 367
Carica 446
Carota 426
Carpobalsamum 285
Carum carui 360
Caryophylli 434
Caryophyllum rubrum 429
Cascarilla 412
Cassia 493
Cassiae cortex 466
  fistula 301
  senna 338

Page
Castor fiber 365
Castoreum ib.
Cataplasma aluminis 1030
  carbonis ligni 1029
  cerevisiae ib.
  conii 1030
  dauci ib.
  fermenti 1028
  simplex ib.
  sinapis ib.
Catechu 231
Causticum commune acerrimum 692
  mitius 693
Centaurea benedicta 367
Centaureum 371
Cepa 254
Cephaelis ipecacuanha 479
Cera flava 367
  alba 368
Ceratum 1031
  calaminae 1053
  cantharidis 1043
  carbonatis zinci impuri 1053
  cetacei 1036
  juniperi sabinae 1041
  lyttae 1042
  plumbi acetatis 1051
    compositum 1052
  resinae 1037
  sabinae 1041
  saponis 1052
  simplex 1035
Cerevisiae fermentum 370
Cerussa 558
  acetata 819
Cervus elaphus 370
Cetraria Islandica 504
Cetaceum 621
Chamaemelum 289
Chelae cancrorum 346
Chironia centaureum 371
Cicuta 401
Cinchona cordifolia 372
  lancifolia ib.
  oblongifolia ib.
  officinalis ib.
Cineres clavellati 346
Cinnabar 816
Cinnamomum 493
Citrus aurantium 497
  medica 389
Clutia elutheria 413
Cnicus benedictus 367
Coccinella 394
Coccus cacti ib.
Cocculus 390
  palmatus 392
  suberosus 390

Page
Cochlearia armoracia 396
  officinalis ib.
Cocos butyracea 397
Colchicum autumnale 399
Colocynthidis pulpa 415
Columbo 392
Confectio amygdalarum 1010
  aromatica 1012
  aurantiorum 1011
  cassiae 1013
  opii 1015
  piperis nigrae 1016
  rosae caninae 1011
    Gallicae ib.
  rutae 1016
  scammoneae 1014
  sennae ib.
Conium maculatum 401
Conserva aurantii 1011
  citri aurantii ib.
  rosae ib.
    caninae ib.
    Gallicae 1012
Contrayervae radix 432
Convolvulus jalapa 405
  scammonia 404
Copaiba 407
Copaifera officinalis ib.
Coriandrum sativum 409
Cornua, Cornu cervinum 370
Cornu ustum 743
Cortex Peruvianus 372
Cremor tartari 565
Crocus sativus 410
Croton cascarilla seu eleutheria 412
  tiglium 413
Creta alba 345
  praeparata 740
Crystalli tartari 545
Cubeba 555
Cucumis colocynthis 415
Cuminum cyminum 417
Cupri acetas 420
  ammoniaretum 774
  ammoniati aqua 775
    liquor ib.
  subacetas 419
    praeparatum 773
  sulphatis solutio composita 773
  sulphas 420
Cuprum 417
  ammoniatum 774
  ammoniaretum ib.
  vitriolatum 419
Curcuma longa 421
Cusparia febrifuga 338
Cuspariae cortex 338
Cyanuretum hydrargyri 813

Page
Cydoniae semina 572
Cynosbatus 591

D

Daphne mezereum 422
Datura stramonium 423
Daucus carota 426
Decoctum althaeae officinalis 908
  aloes comp. 900
  anthemidis nobilis ib.
  chamaemeli comp. ib.
  cinchonae 901
    lancifoliae ib.
  cydoniae 909
  daphnes mezerei 902
  dulcamarae ib.
  Geoffraeae inermis 903
  glycyrrhizae ib.
  guaiaci comp. ib.
  haematoxyli 904
  hordei distichi 909
    compositum 910
  lichenis islandici ib.
  malvae comp. 901
  papaveris 904
  polygalae senegae ib.
  pyrolae ib.
  quercus 905
  sarsaparillae ib.
    comp. 906
  senegae 904
  smilacis sarsaparillae 905
  taraxaci 906
  veratri ib.
  ulmi ib.
Delphinium staphisagria 427
Diachylon 1061
Dianthus caryophyllus 428
Digitalis purpurea ib.
Diosma crenata 430
Diplolepsis gallae tinctoriae 448
Dolichos pruriens 434
Dorstenia contrajerva 432
Dryabalanops camphora 432
Drymis aromatica 646
Dulcamara 619

E

Elaterium 517, 859
Electuarium aromaticum 1012
  cassiae fistulae 1013
  catechu compositum ib.
  opiatum 1015
  sennae ib.

Page
Electuarium sennae comp. 1014
  scammonii ib.
  Thebaicum 1045
Elemi 283
Eleutheria 412
Elixir paregoricum 961, 971
  sacrum 962
  salutis 971
Emplastrum ammoniaci 1057
    cum hydrarg. 1065
  aromaticum 1058
  assae foetidae 1063
  belladonnae ib.
  cantharidis 1058
    vesicatoriae ib.
    comp. 1059
  calefaciens ib.
  cerae 1056
  cumini 1065
  galbani 1064
    comp. ib.
  gummosum ib.
  hydrargyri 1065
  lithargyri 1061
    cum resina 1062
  opii ib.
  oxidi ferri rubri 1066
    plumbi semivitrei 1060
  picis compositum 1060
  plumbi 1061
  resinae 1062
  resinosum 1061
  saponaceum 1062
  saponis ib.
    comp. vel adherens 1063
  simplex 1056
  thuris 1066
Emulsio amygdalae communis 930
  acaciae Arabicae ib.
  camphorae 932
Enema catharticum 936
  foetidum ib.
  opii 937
  terebinthinae 936
Erythraea centaurium 371
Eugenia caryophyllata 434
Euphorbia officinarum 436
Exsiccatio herbarum et florum 845
Extractio pulparum 859
Extracta simpliciora 983
  per aquam ib.
    et alcohol 991
Extractum anthemidis nobilis 984
  absinthii 983
  aconiti 856
  aloes hepatici 983
    purificatum 984

Page
Extractum artemisiae absinthii 983
belladonnae 857
catechu 231
chamaemeli 983
cinchonae 984
resinosum 991
lancifoliae ib.
colocynthidis comp. ib.
simplex 985
convolvuli jalapae 991
conii 857
elaterii 859
genistae 984
gentianae 986
luteae 984
glycyrrhizae 986
glab. 984
haematoxyli 986
Campechiani 984
hellebori nigri ib.
hyosciami 857
humuli lupuli 984, 986
jalapae 991
lactucae 993
nucis vomicae 992
opii aquosum 986
papaveris somnif. 984, 988
pini 545
quercus 984
rhei 992
rutae graveolentis 984
sarsaparillae 988
fluidum ib.
spartii scopariae 984
stramonii 989
taraxaci 984, 989

F

Farina 637
Fermentum cerevisiae 370
Ferri acetas 787
acetatis tinctura 788
cum alcohol tinctura 789
alkalini liquor ib.
ammoniati tinctura 785
et ammoniae murias 783
carbonas 778
praecipitatus ib.
cyanuretum 442
fila 400
limatura ib.
purificata 776
muriatis tinctura 782
oxidum nigrum 441, 776
purificatum 776
rubrum 781
rubigo 778

Page
Ferri scobs 440
squamae 441
purificatae 776
subcarbonas 778
praeparatus ib.
sulphas 422, 780
exsiccatus 781
sulphuretum 654
tartarum 785
vinum 787
Ferrum 438
ammoniatum 784
tartarizatum 785
Ferula assafoetida 444
Ficus carica 446
Filix mas 324
Flores martiales 783
Foeniculum anethum 287
Fraxinus ornus 510
Fucus vesiculosus 447

G

Galbanum 342
Gallae 448
Gambogia gutta 450
Garcinia gambogia ib.
Genista 621
Gentiana lutea 452
Geoffroya inermis 453
Geum urbanum 454
Glycyrrhiza glabra ib.
Granati cortex 570
Gratiola officinalis 457
Guaiacum officinale ib.
Gummi Arabicum 226
acaciae ib.
mimosae Niloticae ib.
tragacantha 326
resina ammoniaci 264
bubonis galbani 342
convol. scam. 404
ferulæ assæfœtidæ 444
gambogia 450
guaiaci officinalis 547
juniperi lyciae 486
kino 487
myrrha 525
sagapenum 598
resinae 998

H.

Haematoxylon Campechianum 460
Helenium 476

Page
Helleborus albus 640
  foetidus 462
  niger 461
Hepar sulphuris 652
Heracleum gummiferum 264
Herbarum exsiccatio 845
Hirudo medicinalis 463
Hordeum distichon 465
Humulus lupulus 467
Hydrargyri acetas 797
  cyanuretum 813
  nitrico-oxydum 795
  oxidum cinereum 793
    rubrum 795
    per acid. nitric. ib.
  oxydum nigrum 793
    nitricum 795
    rubrum 794
    sulphuricum 802
  oxymurias 803
  oxymuriatis liquor 806
  persulphas 800
  submurias 807
    mitis 806
    sublimatum ib.
    praecipitatus 809
    ammoniatum 812
  subsulphas flavus 802
  sulphuretum nigrum 814
    rubrum 816
Hydrargyrum 469
  cum creta 792
  cum magnesia 790
  purificatum ib.
  praecipitatum album 812
Hydriodas potassae 709
Hydro-sulphuretum ammoniae 655
Hyoscyamus niger 473
Hyssopus officinalis 475

I

Infusum acaciae catechu 890
  angusturae 893
  anthemidis nobilis 891
  armoraciae comp. ib.
  aurantii comp. ib.
  buchu 892
  calumbae 891
  caryophyllorum ib.
  cascarillae ib.
  cassiae sennae 897
  catechu compositum 890
  chamaemeli 891
  cinchonae 893
    lancifoliae 892
  cuspariae 893
  digitalis purpureae ib.
  gentianae compositum 894

Page
Infusum lini 894
  menthae compositum ib.
  quassiae excelsae ib.
  rhei 896
  rosae Gallicae ib.
    acidum 897
  sarsaparillae comp. 897
  sennae 897
    cum tamarindis 898
  simaroubae 899
  tabaci ib.
  valerianae ib.
Inula helenium 476
Iodinium 477
Ipecacuanha 479
Iris florentina 483

J

Jalapa 405
Juniperus communis 484
  lycia 486
  sabina 485

K

Kermes mineralis 752
Kino 487, 569
Krameria triandria 490

L

Lactuca virosa 491
  sativa ib.
Lactucarium ib.
Lapilli cancrorum 346
Lapis calaminaris 647
  praeparatus 825
Laudanum liquidum 960, 977
Laurus camphora 347, 500
  cassia 493
  cinnamomum ib.
  nobilis 500
  sassafras ib.
Lavandula spica 501
Leontodon taraxacum 502
Lichen Islandicus 504
Lignum 461
Limatura ferri 440
  purificata 776
  stanni 625
Limon 389
Limones 389
Linimentum ammoniae 864
  fortius ib.
  subcarb. ib.
  arcaei 1038
  anodynum 964

Page
Linimentum aquae calcis 865
  aeruginis 929
  calcis 865
  camphorae compositum 970
  hydrargyri 1047
  saponaceum 964
  saponis ib.
    compositum ib.
    cum opio ib.
  simplex 1035
  terebinthinae 1038
Linum catharticum 506
  usitatissimum ib.
Liquor aethereus oleosus 838
    sulphuricus 833
  aluminis compositus 827
  ammoniae 723
    acetatis 732
    subcarbonatis 730
  antimonii tartarizati 764
  arsenicalis 770
  calcis 737
  calcis muriatis 742
  cupri ammoniati 775
  ferri alkalini 789
  hydrargyri oxymuriatis 806
  muriatis ferri 782
  plumbi subacetatis 820
    dilutus 821
  potassae 688
  subacetatis lithargyri 820
    comp. 821
  subcarbonatis potassae 697
Lithargyrum 558
Lithrum salicaria 507
Litmus 589
Lixivus cinis 561
Lytta vesicatoria 352

M

Macis 521
Magnesia 745
  carbonas 747
  subcarbonas 507
  sulphas 508
    purum 750
  usta 745
Maltha 335
Malva sylvestris 509
Manganesium oxydum 509
Manna 510
Majorana 352
Marmor album 344
Marrubium vulgare 512
Mastiche 556

Page
Matonia cardamomum 272
Matricaria chamomilla 290
Mel 512
  Ægyptiacum 929
  boracis 927
  despumatum 925
  rosae Gallicae 927
  subboratis sodae 926
Melaleuca leucadendron 514
  cajuputi ib.
Melampodium 461
Melissa officinalis 515
Menispermum cocculus 390
Mentha piperita 515
  pulegium 516
  viridis 515
Menyanthes trifoliata 516
Mercurius praecipitatus ruber 795
  sublimatus corrosivus 803
Mezereon 422
Mimosa Arabica 226
  catechu 231
Minium 559
Mistura ammoniaci 932
  amygdalarum 930
  assaefoetidae 933
  camphorae 932
    cum magnesia ib.
  cornu usti 934
  cretae ib.
  ferri composita 935
    aromatica 936
  guaiaci 933
  moschi 934
Momordica elaterium 517
Moschus 518
Moschus moschiferus ib.
Moxa 322
Mucilago amyli 908
  acaciae 907
  gummi Arabici ib.
  astragali tragacanthae 908
  gummi tragacanthae 909
  cydoniae ib.
Murias ammoniae 268
    et ferri 783
  barytae 733
  calcis 741
  hydrargyri corrosivus 803
  sodae 617
Muriatis barytae solutio 733
  calcis solutio 741
  ferri tinctura 782
Myristica moschata 521
Myroxylon Peruiferum 523
Myrrha 525
Myrtus pimenta 526

N

Page
Naphtha 335
Nicotiana tabacum 527
Nitras argenti 767
fusum ib.
potassae 563
Nitrico-oxydum hydrargyri 795
Nitrum 563
Nux moschata 521
vomica 626

O

Oculi cancrorum 346
Olea Europaea 529
essentialia 869
destillata ib.
volatilia 868
Oleum aethereum 837
ammoniatum 864
amygdalae communis 862
cajeput 514
camphoratum 865
caryophyllorum 434
coci butyraceae 397
lauri cinnamomi 493
nobilis 500
limonum 389
lini 863
cum calce 865
usitatissimi 863
macis 521
oleae Europaeae 529
olivarum ib.
ricini 863
succini 877
purissimum ib.
rectificatum ib.
sulphuratum 866
terebinthinae 875
rectificatum ib.
tiglii 414
volatile anisi 870
anthemidis 869
baccarum juniperi ib.
carui ib.
caryophyllae arom. 434
citri aurantii 387
medicae 389
foeniculi dulcis 869
juniperi communis ib.
sabinae ib.
lauri sassafras ib.
lavandulae spicae ib.
macis 521
menthae piperitae 869
melaleucae leucad. 514

Page
Oleum volatile myristicae moschat. 521
myrti pimentae 869
origani 531, 870
pimento 869
pimpinellae anisi 870
pini purissimum 875
pulegii 870
rorismarini officinal. ib.
rosmarini ib.
rutae ib.
sabinae 869
sassafras ib.
succini 684
terebinth. rectificat. 875
Olibanum 342
Oliva 529
Opium 534
Opobalsamum 285
Opoponax 543
Origanum majorana 532
vulgare 531
Ossa 532
Ostrea edulis 347
Ovum 533
Oxalis acetosella ib.
Oxydum antimonii nitro-muriat. 755
cum phosphate calcis 756
Oxydum arsenici sublimatum 769
ferri nigrum 441
purificatum 776
rubrum 781
hydrargyri cinereum 793
nigrum ib.
nitricum 795
rubrum 794
rub. per ac. nit. 795
sulphuricum 802
plumbi rubrum 559
semivitreum 558
zinci 822
impurum 647
praepar. 825
Oxymurias hydrargyri 803
liquor 806
Oxymel 928
aeruginis 929
colchici 928
cupri subacetatis 929
scillae ib.
simplex 928

P

Palma Christi 585
Papaver rhoeas 534
somniferum ib.
Pastinaca opoponax 543
Persulphas hydrargyri 800

Page
Peruvianus cortex 372
Petroleum 335
Phasianus gallus 533
Phosphas sodae 716
Physeter macrocephalus 621
Pilulae aloes compositae 1020
    et assafoetidae 1021
    et myrrhae ib.
  aloeticae 1020
  ammoniareti cupri 1025
  assafoetidae compositae 1021
  calomelanos compositae 1027
  cambogiae comp. 1023
  colocynthidis compositae 1022
  ferri comp. 1025
  galbani compositae 1022
  hydrargyri 1026
    submuriatis comp. 1027
  opiatae 1023
  rhei compositae 1024
  saponis cum opio 1023
  scillae compositae 1024
  scillae cum zingibere 1025
  scilliticae ib.
  subcarbonatis sodae 1024
  sulphatis ferri comp. 1026
  e styrace 1024
  Thebaicae 1023
Pimenta 526
Pimpinella anisum 544
Pinus abies 545
  balsamea ib.
  larix ib.
  sylvestris ib:
Piper cubeba 555
  Indicum 355
  Jamaicense 526
  longum 555
  nigrum 553
Pistacia lentiscus 556
  terebinthus ib.
Pix Burgundica 545
Pix liquida ib.
Plumbi acetas 818
  subcarbonas 558
  subacetatis liquor 820
    comp. 821
    dilutus ib.
Plumbum 557
Polygala senega 560
Polygonum bistorta 561
Polypodium filix mas 324
Porri radix 252
Potassa 692
  impura 561
  fusa 692
  caustica ib.
  cum calce 693

Page
Potassae acetas 705
  aqua 688
  bicarbonas 698
  bisulphas 703
  carbonas 698
    e lixivo cinere 694
    e tartari crystal. 695
    purissimus 694
  causticae aqua 689
  et ferri tartras 785
  et sodae tartras 720
  hydriodas 709
  liquor 688
  nitras 563
    purificatus 705
  subcarbonas 694
    impurus 561
    purissimus 694
  subcarbonatis liquor 697
  supercarbonatis aqua 700
  supersulphas 702
  supertartras 565
    impurus ib.
  sulphas 564
    cum sulphure 704
  sulphuretum 651
    aqua 653
  tartras 707
    et sodae 702
Potio carbonatis calcis 934
Prunus domestica 566
  Gallica ib.
  laurocerasus ib.
Pterocarpus santolinus 568
  draco ib.
  erinacea 569
Pulegium 515
Pulparum extractio 859
Pulveres 1002
Pulvis algarothi 755
  aloes cum canella 1002
    compositus ib.
  aluminis compositus 1003
  antimonialis 756
  aromaticus 1003
  asari compositus 1004
  carbonatis calcis comp. ib.
  cinnamomi comp. 1003
  cornu cervini usti 743
    cum opio 1006
  cretae compositus 1004
    cum opio ib.
  contrayervae compositus 1005
  ipecacuanhae et opii ib.
    compositus ib.
  jalapae compositus 1006
  kino comp. ib.
  opiatus ib.

Page
Pulvis pro cataplasmate 1008
  salinus compositus 1007
  scammonii compositus ib.
  scillae 849
  sennae compositus 1007
  spongiae ustae 850
  stanni 822
  stypticus 750
  tragacanthae compositus 1008
Punica granatum 570
Pyrethrum 289
Pyrola umbellata 571
Pyrus cydonia 572

Q

Quassia excelsa 574
  simaruba 573
Quercus robur 575
  pedunculata ib.
  infectoria 448
Quininae sulphas 994

R

Ranunculus 575
Resina alba 545
Resina pini 549
  copaiferae officinalis 407
  flava, *Lond.* 545
    Dub. 1000
  guaiaci 548
  liquida amyridis Gileaden. 284
    pini balsameae 545
      laricis ib.
      abietis ib.
  pistaciae lentisci 556
  pterocarpi draconis 568
Rhabarbarum 577
Rhamnus catharticus 576
Rhatania 490
Rheum Britannicum 577
  palmatum ib.
  Russicum ib.
  Sinense ib.
  Turcicum ib.
  undulatum ib.
Rhododendron crysanthum 583
Rhus toxicodendron 584
Ricinus communis 585
Rob sambuci 857
Rocella tinctoria 589
Rosa canina 591
  centifolia 590
  Damascena ib.
  Gallica ib.
  rubra ib.

Page
Rosmarinus officinalis 592
Rubia tinctorum ib.
Rubigo ferri 778
Rumex acetosa 593
  aquaticus ib.
Ruta graveolens 594

S

Sabina 485
Saccharum non purificatum 595
  officinarum ib.
  purificatum ib.
  purissimum ib.
  rubrum ib.
  saturni 819
Sagapenum 598
Sal ammoniacum 268
  catharticum amarum 508
  commune 617
  marinus ib.
  tartari 687
Salix alba, fragilis, &c. 599
Salvia officinalis 600
Sambucus nigra 601
Sanguis draconis 568
Santalum rubrum ib.
Santonicum 321
Sapo 602
Sarsaparilla 610
Sassafras 493
Saturni saccharum 819
Scammonium 404
Scammoneae gummi-resina 404
Scilla maritima 605
  exsiccata 849
Scillae pulvis ib.
Scobs ferri 440
Scrophularia nodosa 607
Senegae radix 560
Senna 360
Serpentaria 507
Sevum 244
  praeparatum 1033
  physeteris macrocephali 621
Simarouba 573
Sinapis alba 607
  nigra 608
Sisymbrium nasturtium 609
Smilax sarsaparilla 610
Soda impura 612
  tartarizata 721
Sodae acetas 716
  bicarbonas 713
  boras 615
  carbonas 713
    impurus 612
    siccatum 713

Page
Sodae carbonas venale 613
  et potassae tartras 720
  murias 617
  phosphas 716
  subcarbonas 711
    impurus 612
    exsiccata 712
  supercarbonatis aqua 715
  sulphas 619, 719
Solanum dulcamara 619
  lethale 328
Solutio acetatis zinci 828
  arsenicalis 770
  calcis 737
  muriatis barytae 735
    calcis 741
  sulphatis cupri composita 773
    zinci 827
  subcarbonatis ammoniae 730
Spartium scoparium 621
Spermaceti ib.
Spigelia marilandica 623
Spiritus aetheris nitrosi 842
    nitrici ib.
    sulphurici 838
      compositus 837
  aethereus nitrosus 842
  ammoniae 727
    aromaticus 888
    fœtidus ib.
  succinatus 971
  anisi 884
    compositus 886
  armoraciae comp. 887
  camphoratus 947
  camphorae ib.
  cari carui 584
  cinnamomi ib
  colchici ammoniata 971
  juniperi compositus 886
  lauri cinnamomi 884
  lavandulae spicae 885
    compositus 985
  menthae piperitae 884
    viridis 885
  mindereri 732
  myristicae moschatae 884
  myrti pimentae ib.
  nucis moschatae ib.
  pimento ib.
  pulegii 885
  raphani compositus 887
  rectificatus 246
  rorismarini 885
  stillatitii 884
  tenuior 249
  vinosus tenuior 249
Spongia officinalis 624
Spongiae ustae pulvis 850

Page
Squamae ferri 441
    purificata 776
Stalagmitis cambogioides 450
Stannum 625
Stanni pulvis 822
Staphisagriae semina 427
Stibium 292
Stramonium 423
Strychnos nux vomica 626
Styrax benzoin 629
  calamita ib.
  officinale 628
  purificata 999
Subacetas cupri 417
    praeparatum 773
Subacetatis plumbi liquor 820
      comp. 821
Sub-boras sodae 615
Subcarbonas ammoniae 728
  ferri praeparatus 778
  plumbi 558
  potassae 693
    impurus 561
    purissimus 694
  sodae 711
    impurus 612
    exsiccata 712
Subcarbonatis potassae liquor 697
  ammoniae liquor 730
Submurias hydrargyri mitis 806
    sublimatum ib.
    præcipitatus 809
    ammoniat. 812
Subnitras bismuthi 771
Subsulphas hydrargyri flavus 802
Succinum 631
Succini acidum et oleum 684
  oleum purissimum 877
Succus concretus fraxini orni 510
  rhamni cathartici 576
  spissatus aconiti napelli 856
    atropae belladon. 857
    conii maculati ib.
    hyosciami nigri ib.
    lactucae sativae ib.
    virosae ib.
    papaveris somniferi 535
    sambuci nigri 857
Sulphas aluminae et potassae 262
    exsiccatum 750
  barytae 334
  cupri 417
  ferri 442
    exsiccatus 781
  magnesiae 507
  potassae 564
    cum sulphure 704
  quininae 994

Page
Sulphas sodae 719
zinci 826
Sulphatis cupri solutio composita 773
zinci solutio 827
Sulphur 633
antimoniatum fuscum 753
lotum 649
praecipitatum ib.
sublimatum 632
lotum 649
Sulphureti ammoniae aqua 655
Sulphuretum antimonii 292
praecipitat. 752
praeparatum 752
ferri 654
hydrargyri nigrum 814
rubrum 816
potassae 651
Supercarbonatis potassae aqua 700
sodae aqua 715
Supersulphas aluminae et potassae 262
potassae 702
Supertartras potassae 565
impurus 561
purificata 565
Syrupi 912
Syrupus aceti 913
althaeae officinalis 914
amomi zingiberis 915
aurantii 916
cassiae sennae 915
citri aurantii 916
medici 917
colchici autumnalis ib.
croci 918
dianthi caryophylli ib.
empyreumaticus 595
limonum 917
mori 918
papaveris somniferi 919
rhoeados 920
rhamni ib.
rhoeados 920
rosae 922
Gallicae ib.
centifoliae ib.
sarsaparillae 923
sennae 915
scillae maritimae 923
simplex 911
toluiferae balsami 923
tolutanus 924
violae odoratae ib.
zingiberis 915

T

Tabaci folia 527
Tamarindus Indica 634
Tanacetum vulgare 635

Page
Taraxaci radix 502
Tartras potassae 707
et ferri 785
et sodae 720
Tartari crystalli 565
sal 687
Tartras emeticus 752
crudus 565
Tartarus purificatus 565
vitriolatus acidus 701
Tartarum 561
antimonii 760
antimoniatum 760
emeticum ib.
ferri 785
solubile 707
potassae 707
et sodae 720
Terebinthina Canadensis 545
Chia 556
Veneta 545
vulgaris ib.
Terra ponderosa 334
Testae ex ostrea eduli 347
praeparatae 740
Thus 545
Tiglii oleum 412
Tinctura aloes 943
aetherea 968
socotorinae 943
et myrrhae 944
composita ib.
ad stomachicos 976
acaciae catechu 950
acetatis ferri 788
cum alcohol 789
zinci 829
amomi repentis 945
zingiberis 967
angusturae 945
aristolochiae serpentariae 968
aromatica ammoniata 885
assae foetidae 947
ammoniata 886
aurantii 945
balsami Tolutani 946
benzoini composita ib.
bonplandiae trifoliatae 945
buchu 946
camphorae 947
comp. 962
calumbae 953
cantharidis 947
capsici 950
cardamomi 998
composita ib.
cascarillae 949
castorei ib.
composita 970
rossici 949

Page

- Tinctura catechu 950
  - cinchonae composita 951
    - lancifoliae 950
    - ammoniata 970
  - cinnamomi 952
    - composita ib.
  - columbae 953
  - conii maculati ib.
  - convolvuli jalapae 958
  - croci sativi 953
  - crotonis eleutheriae 949
  - digitalis purpureae 954
  - ferulae assae foetidae 945
  - ferri ammoniati 785
  - galbani 549
  - gallarum 955
  - gentianae composita ib.
  - guaiaci ib.
    - officinalis ib.
    - ammoniata 971
  - hellebori nigri 956
  - humuli ib.
  - hyosciami nigri 957
  - iodinii 957
  - jalapae 958
  - kino ib.
  - lauri cinnamomi 952
  - lyttae 947
  - meloes vesicatorii ib.
  - moschi 959
  - myrrhae ib.
  - muriatis ferri 782
  - nucis vomicae 960
  - opii ib.
    - camphorata 961
    - ammoniata 971
  - piperis cubebae 954
  - quassiae 962
  - rhei 962
    - comp. 963
    - et aloes ib.
    - et gentianae ib.
  - saponis camphorata 964
    - et opii ib.
  - scillae 965
  - seminum colchici 952
  - sennae composita 965
  - serpentariae ib.
  - stomachica 948
  - thebaica 960, 977
  - Toluiferi balsami 946
  - Tolutani balsami 966
  - valerianae ib.
    - ammoniata 972
  - veratri albi 967
  - zingiberis ib.
- Toluifera balsamum 523
- Tormentilla erecta officinalis 636
- Toxicodendri folia 584

Page

- Tragacantha 362
- Trifolium paludosum 516
- Triticum hybernum 637
- Trochisci carbonatis calcis 1017
    - magnesiae ib.
  - glycyrrhizae glabrae ib.
    - cum opio 1018
  - gummosi 1019
  - nitratis potassae ib.
- Turpethum minerale 862
- Tussilago farfara 638
- Tutia 647
  - praeparata 825

U

- Ulmus campestris 639
- Unguentum acetatis plumbi 1051
  - acidi nitrosi 1055
    - nitrici ib.
    - sulphurici 1056
  - album 1037
  - cantharidis 1042
  - calaminae 1053
  - carbonatis plumbi 1051
  - cerae albae 1036
    - flavae ib.
  - cerussae 1051
  - cetacei 1035
  - citrinum 1049
  - coeruleum 1044
  - conii 1039
  - elemi 1038
    - compositum ib.
  - epispasticum fortius 1042
    - mitius 1041
  - gallarum 1040
  - hellebori albi 1042
  - hydrargyri 1044
    - fortius 1045
    - mitius 1047
    - nitratis 1049
      - fortius ib.
      - mitius ib.
    - oxydi nitrici 1048
    - praecipitati albi 1047
  - iodinii 1055
  - infusi cantharidis vesicatoriae 1042
  - lyttae ib.
  - oxidum zinci 1053
    - impuri ib.
  - oxydi hydrargyri cinerei 1047
    - rubri 1048
  - plumbi albi 1051
    - carbonatis ib.
  - picis nigri 1039
    - liquidae 1038

Page
Unguentum piperis nigri 1040
potassae hydriodatis 1055
pulveris cantharidis vesicatoriae 1043
resinae albae 1037
nigrae 1038
resinosum 1037
sabinae 1041
sambuci 1040
saturninum 1051
scrophulariae 1041
simplex 1035
spermatis ceti ib.
subacetatis cupri 1044
submuriatis hydrargyri ammoniati 1048
sulphuris 1054
compositum ib.
tartari emetici 1043
tutiae 1053
veratri 1042
zinci 1054
Uva ursi 304
Uvae passae 645

V

Valeriana officinalis 639
sylvestris ib.
Vegetabilium exsiccatio 845
praeparatio 844
Veratria 400
Veratrum album 640
Vinum album Hispanum 642
aloes socotorinae 974
amarum ib.

Page
Vinum antimonii tartarizati 764
antimoniale 758
colchici 975
ferri 787
gentianae compositum 975
ipecacuanhae 976
nicotianae tabaci ib.
opii ib.
rhei 977
tartratis antimonii 764
veratri 977
Verbascum thapsus 641
Viola ipecacuanha 481
odorata 644
Vitis vinifera 645
Vitrioleum coeruleum 420
Vitrum antimonii 295

W

Wintera aromatica 646

Z

Zinci oxidum 882
impurum 647
praeparat. 825
acetatis solutio 828
tinctura ib.
carbonas impurus 647
praeparat. 825
sulphas 826
sulphatis solutio 827
Zincum 646
vitriolatum 825
Zingiber 270

THE END.

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8508